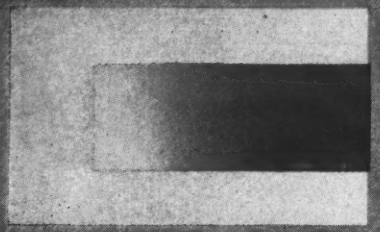
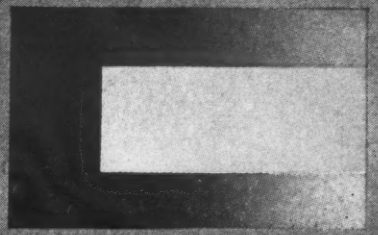
THE DENTAL Digest

SEPTEMBER 1945

BUY VICTORY BONDS



USE THE YELLOW
TO SEE THE RED



USE THE RED
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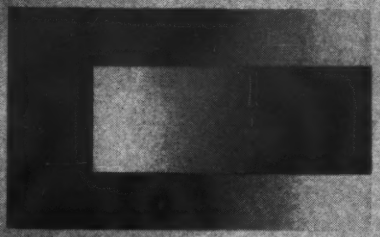
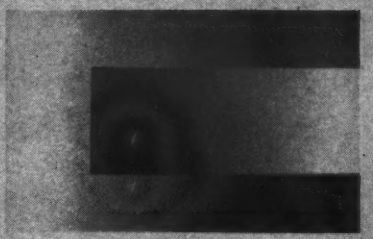


USE THE LIGHT
TO SEE THE DARK



USE THE DARK
TO SEE THE LIGHT

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THE DENTAL Digest

VOL. 51 NO. 9

September 1945

A Simplified Full Lower Denture Impression Technique.....486
Lieutenant Colonel Clyde L. Sloss (DC) AUS and Captain Murray N. Rubinstein (DC) AUS

A Simplified Technique for Exposing the Unerupted Maxillary Cuspid, *James H. Keith, D.M.D.*..490

Clinical Diagnosis and Treatment of Palatally Impacted Cuspids, *B. F. Dewel, D.D.S.*.....492

The Roofless Denture, *Louis A. Hawkes, D.D.S.*.....498

The Present-Day Concept of Vincent's Infection (Conclusion), *Howard A. Hartman, D.D.S.*.....501

Clinical and Laboratory Suggestions.....506

1. Replacement of a Lower Second Bicuspid. 2. Determination of the Median Line of Wax Bite Blocks. 3. A Handy Pad for Use in Spatulating Impression Pastes. 4. Pre-Extraction Treatment of Pericoronitis. 5. A Modified Saliva Ejector. 6. An Instrument for Making Wax Patterns. 7. A Vibrator for Investing Inlays. 8. A Double-Surface Finishing Disc. 9. A Cavity Varnish Bottle and Applicator Unit. 10. A Method of Making Die Stone Models. 11. A Cotton Roll Holder Made From a Rubber Dam Clamp. 12. An Individual Tray for Colloid Impressions.

The Editor's Page.....507 Contra-Angles.....512

Ninety Cases of Fractured Jaws (An Abstract).....504

Rubber Tubing in Penicillin Drip (An Abstract).....504

The Treatment of Acute and Chronic Infections of the Jaw with Antibiotics (An Abstract).....519
Leo Stern, D.D.S.

The Etiology of Subacute Ulcerative Gingivitis (An Abstract).....528
Captain G. Cocker, L.D.S. and *Lieutenant Colonel J. W. Bigger, M.D.*

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JAMES H. KEITH, D.M.D. (Tufts Dental College, 1912) limits his practice to oral surgery. Doctor Keith is a contributing editor for the *Illinois Dental Journal*. He presents here A SIMPLIFIED TECHNIQUE FOR EXPOSING THE UNERUPTED MAXILLARY CUSPID.

B. F. DEWEL, D.D.S. (State University of Iowa, College of Dentistry, 1925), orthodontist, wrote for us in June and July 1944 on CONTRAINDICATIONS FOR SURGICAL RESECTION OF THE MAXILLARY LABIAL FRENUM. In this issue Doctor Dewel discusses the clinical diagnosis of palatally impacted cuspids and the orthodontic treatment that should follow surgical exposure of the tooth.

LOUIS A. HAWKES, D.D.S. (The University of Pennsylvania College of Dental Surgery, 1902) wrote for us in September 1933 on ROOFLESS DENTURES. Doctor Hawkes now describes his technique for accurately determining the margin of the roofless denture and his method of obtaining the inner seal.

HOWARD A. HARTMAN, D.D.S. (Western Reserve University, School of Dentistry, 1928) emphasizes periodontia in his general practice. Last month he discussed the symptoms, etiologic factors, and diagnosis of Vincent's infection. This month he considers the differential diagnosis and technique of treatment of the condition.

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A Simplified Full Lower Denture Impression Technique

Lieut. Col. CLYDE L. SLOSS (DC) AUS and Capt. MURRAY N. RUBINSTEIN* (DC) AUS

A simplified method of securing a full lower impression which will produce an accurate reproduction of the denture-bearing areas is presented. Suggestions for designing the border outline of the full lower denture also are listed.

INNUMERABLE techniques for taking a full lower denture impression, which seem to become increasingly involved, have been described in the literature from time to time. An attempt is made here to describe an extremely simplified technique which has had widespread application for the last ten years. Because of the high percentage of excellent results obtained, it has been the accepted operation technique at this station for the last year. The number of dentures successfully constructed is demonstrable proof of its value. The technique is, moreover, a veritable time saver. We do not claim that this technique should replace all others, but it is our belief that in the hands of the average practitioner the results obtained will justify its use.

Knowledge of the anatomy of the musculature of the mandible is of fundamental importance. It is implied that dentists are acquainted with correct border outline for the lower denture, inasmuch as the purpose of this technique is to secure an accurate overextended impression of the mandible. The reason for this is well stated by Swenson and Tropozzano[1] who claim, "The mandibular denture should not be as difficult as it might seem because the bearing area is broad, and the seal is down a long way below the occlusal surface; thus it is not easily broken."

*Retired from Service.

[1]Swenson, M. G., and Tropozzano, V. R.: Complete Dentures, St. Louis, The C. V. Mosby Company, 1940.

Fig. 1—Pencil line indicates amount of tray that should be removed.

To take advantage of this basic principle, it follows that the impression must encompass all the coverable area. Thus it is far wiser for the impression to be overextended rather than risk underextension. The technique described will enable the operator to secure a most desirable result.

Technique

1. The trays used are the aluminum type, numbers 15A, 23, or 24. After examination of the mouth, the size of the arch determines which should be selected. The tray should be cut down approximately half its depth along the entire periphery. Figure 1 shows the pencil outline for cutting.

2. The heel and molar buccal area of the tray are then bent up and outward slightly to contour for the anterior border of the ramus. The lingual flange at the molar region is bent in. A sheet of hard pink wax is folded in half, and centered and seared to the heels of the tray, following the general contour (Figs. 2A and 2B). The wax is then trimmed to allow for slight overextension in every direction. Figure 3A shows the buccal and lingual contour, and Figure 3B shows the finished tray.

3. Introduce the tray in the mouth to check for approximate fit. Instruct the patient to lift the tongue, and be sure that room for sufficient thickness of plaster is available. There must be space of at least ¼ inch between the ridge and the tray. Figure 4 illustrates the schematic relation of the tray to the ridge.

4. Plaster is now mixed to the consistency of whipping cream and is placed in the tray. Fill the tray generously. As the tray is inserted, instruct the patient to raise the tongue

and direct it forward until the tray is seated firmly. This will cause the palatoglossus muscle and the superior constrictor of the pharynx to contour the distolingual border of the impression. Ewell Neil[2] described this shaping of the lingual flange as "lateral throat form." Have the patient mold the buccal part by muscular movements.

5. Be sure to allow the plaster to set thoroughly. Upon removal of the impression it is usual for one lingual flange to break (Fig. 5); however, the thickness of plaster, due to the shape of the tray, is sufficient to permit accurate reseating without distortion (Fig. 6). The impression may then be boxed and made ready for pouring.

6. The model is then compared with the mouth, and the border limits of the denture are outlined accordingly.

Designing the Peripheral Outline

The following procedure has been adopted in our practice in designing the peripheral outline (Fig. 7). Generally the denture base has been brought up to the flexion line of the musculature; some areas may be carried a little beyond (up to 1 millimeter).

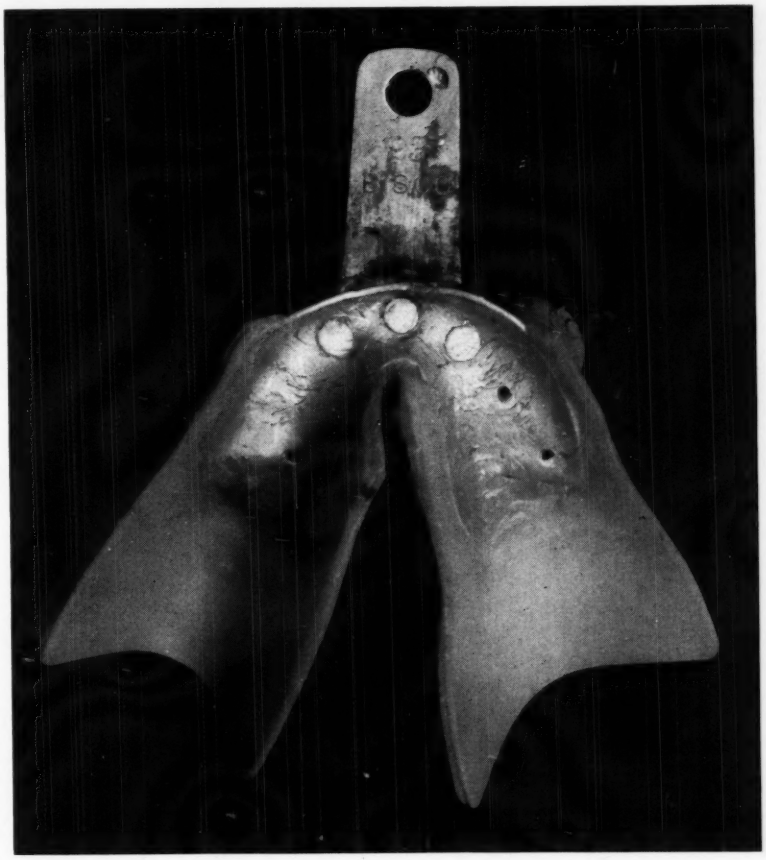
1. Start outlining the cast posteriorly with the retromolar pad. If the pterygomandibular ligament is soft, do not include any of it in the denture; if firm, cover about 1 millimeter.

2. The molar buccal border should, if possible, lie in the retromolar fossa and parallel to the external oblique ridge.

3. The line of periphery at the distobuccal border is determined by noting the action of the masseter muscle when thrusting the mandible to the opposite side.

4. The flange should be thin, with the border round, thick (approximately 3 millimeters), and smooth. If the case has been properly outlined,

[2]Neil, Ewell: Full Denture Practice, Nashville, Marshall and Bruce Company, 1932.



Figs. 2A (top) and 2B—A sheet of hard baseplate wax, folded in half, centered and seared to the heel of the tray.

it will lie beneath the buccal fold with perfect physiologic comfort and will not distort the tissue.

5. The buccal bicuspid area is determined by observation of the active flexion of the buccinator muscle. At this point the denture base should end at the flexion line.

6. The case usually ends anteriorly at the flexion line of the mucous membrane. Action of the levator menti, depressor, and orbicularis oris muscles aids in determining the peripheral line in this region.

7. One must be sure to trim the case lingually from cuspid to cuspid to be sure tongue movements do not dislodge the denture.

8. The border is deepest at the lingual fossa in the bicuspid region because the anterior fibers of the mylohyoid muscle are shortest. This permits accommodation for greater depth of the base, an invaluable aid in the stabilization of the case.

9. The postlingual flange should not extend distally more than half way toward the distal surface of the retromolar tuberosity. It usually ends anterior to a line drawn vertically downward from the distal border of the denture which terminates at the pterygomandibular ligament. This lingual flange should not encroach on the area where the superior constrictor of the pharynx muscle is attached to the mandible. If overextended, the distolingual flange will be lifted by the pterygomandibular ligament when the mouth is opened wide. The lingual flange likewise should not encroach on the palatoglossus muscle. It is advisable, moreover, not to have much depth of the flange in the postmolar area inasmuch as the direct upward action of the mylohyoid muscle will tend to dislodge the case. This area also controls the high tongue floor when it is lifted forward and upward.

Summary

The lingual periphery should be adapted to the toleration of each muscle, particularly the palatoglossus, the superior constrictor of the pharynx,

Fig. 3A (top)—Wax trimmed to permit slight overextension. Note the buccal and lingual contour.
Fig. 3B—Tray ready for taking the impression.

and the anterior fibers of the mylohyoid.

The entire lingual trim is a sealing area and the denture border should extend on to placeable soft tissue. It has been compared to the postdam of the upper when it is extended on the soft palate to maintain the seal.

It might be well to emphasize that all borders should be well rounded and smooth to aid in obtaining an excellent peripheral seal.

Fig. 4—Schematic illustration of relation of tray to ridge.
Fig. 5—Impression on removal from the mouth.
Fig. 6—Completed impression ready for pouring.

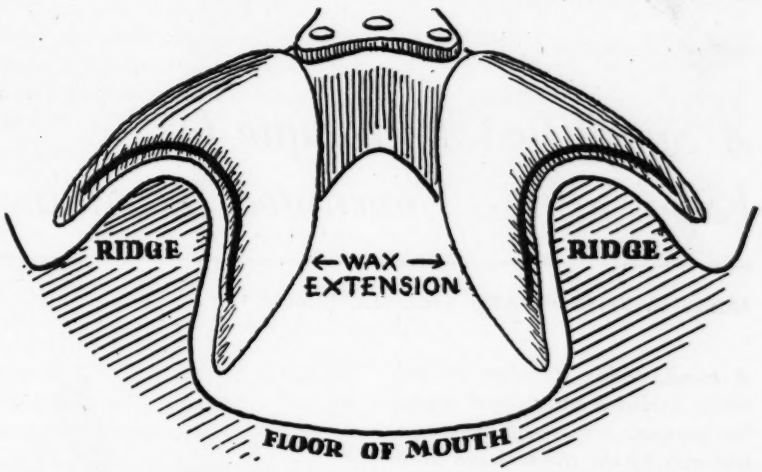


Fig. 4

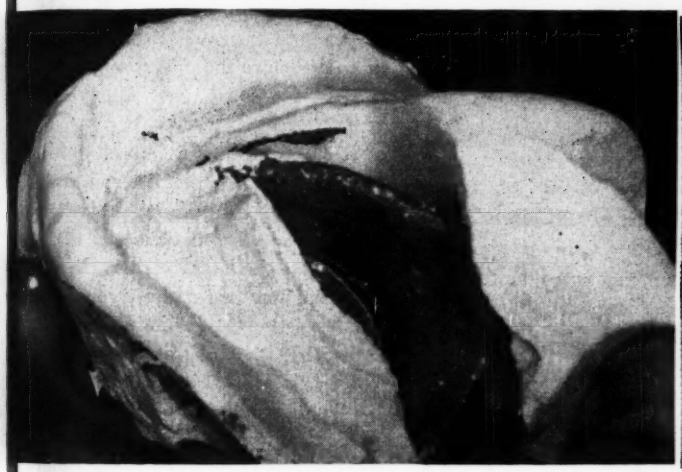


Fig. 5

Fig. 6

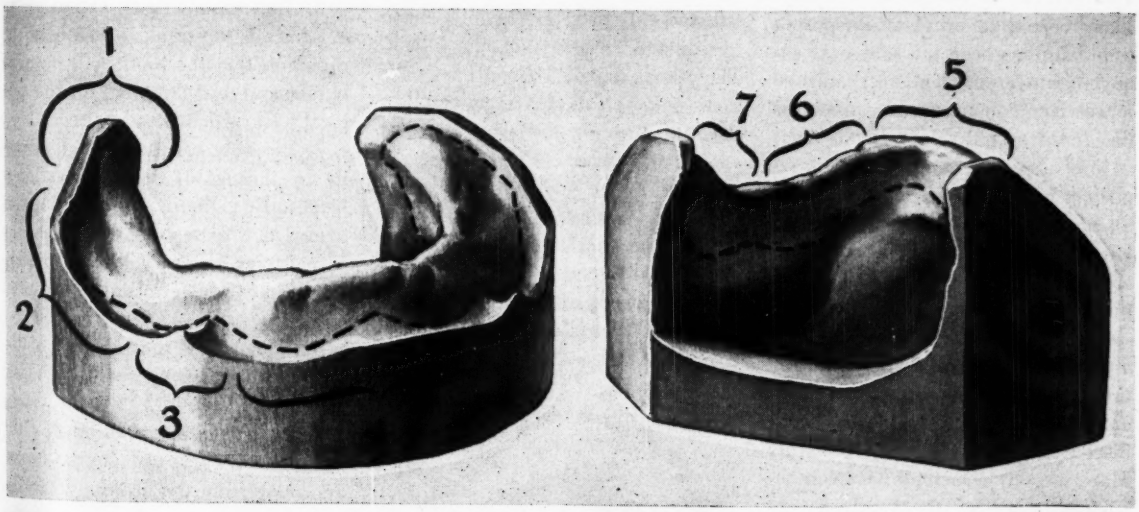


Fig. 7—Lower denture outline: (1) Distal extension area: Denture should end at pterygomandibular ligament. (2) Molar buccal border: Should lie in retromolar fossa and parallel to external oblique ridge. (3) Bicuspid buccal area: Should be at active flexion line of buccinator muscle. (4) Anterior labial area: Should likewise terminate at flexion line. (5) Cuspid to cuspid lingually: Denture must accommodate free tongue movements. (6) Bicuspid lingual border: Generally will be the area of greatest depth. (7) Postlingual flange: Should not extend more than half way toward distal surface of retromolar tuberosity. It is inadvisable to have too great a depth in postmolar area inasmuch as direct upward action of musculature will dislodge denture. In general, lingual flange should extend onto placeable soft tissue.

A Simplified Technique for Exposing the Unerupted Maxillary Cuspid

JAMES H. KEITH, D.M.D., Evanston, Illinois

A considerable number of palatally inclined unerupted maxillary cuspids are kept from erupting only by the thick tissue overlying them. Many of these teeth are palpable and can be uncovered easily. Because infiltration anesthesia is sometimes inadequate, block anesthesia is advised in these cases. Sufficient tissue should be removed to allow the insertion of a surgical cement pack. When this is done the early use of traction to aid the eruption of the tooth is seldom necessary.

The procedure herein described can be followed by the dentist in general practice inasmuch as no special equipment or instruments are used.

THE FAILURE of the permanent maxillary cuspid to erupt at its proper time long has been the source of annoyance to every dentist. Years ago it was common practice to allow the deciduous cuspid to remain in place as long as possible and, when lost, replace it with a fixed bridge. This was an unsatisfactory procedure at best. Later, teeth of this type were uncovered and attempts were made to bring them into position by first drilling a small cavity in the crown, cementing a pin in the cavity, and applying traction. Occasional pulp involvement and subsequent loss of the tooth discouraged use of this technique. More recently a method has been developed whereby the tooth is exposed and allowed to erupt of its own volition.

Locating the Tooth

1. Routine periapical roentgenograms are taken to determine the relation of the unerupted tooth to its neighboring teeth, and likewise the distance of the unerupted tooth from the gingival border. Usually the inclination of the tooth can be determined by palpation, but an occlusal view is of great value.

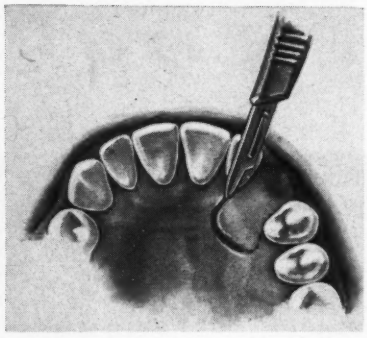


Fig. 1—The incision outline.

2. The occlusal film is placed in the mouth and the patient is instructed to merely rest his teeth against the film and not bite into it. The tube is adjusted directly over the tooth at an 85 degree angle to allow the tube to clear the orbit and rest against the cheek.

3. When the tooth has been located, the operation to uncover it can best be done under procaine anesthesia. Most patients with unerupted cuspids are between the ages of 13 and 17 and are fairly cooperative. Profound anesthesia is essential, however, and in order to be sure of procuring it, both the nasopalatine and the infra-orbital nerve blocks are used, followed by infiltration mesially to the lateral incisor to take care of the anastomosis. Nembutal, ¾ grain, is given to nervous patients twenty minutes before the operation.

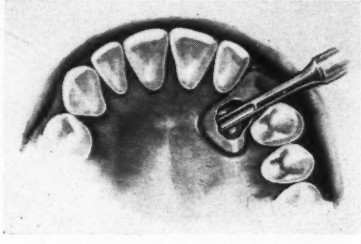


Fig. 2—The incisal edge of the submerged cuspid is exposed.

Exposing the Tooth

1. The first step in the procedure is to extract the deciduous cuspid or, if it is not in place, make an incision through the space from mesial to distal close to the labial border. Parallel incisions are then made through the palatal tissue to a point beyond the estimated site of the unerupted tooth (Fig. 1). This segment is then retracted, grasped with a blunt-nosed ronguer, and pulled downward (Fig. 2). It then can be snipped off readily with surgical scissors (Fig. 3).

2. The reason for so extensive an exposure is to establish a path in the direction that the tooth will naturally take and to make room for the surgical pack which is to be used.

3. Bleeding can be controlled easily by the use of thromboplastin or hemostatic globulin. If the wound has a tendency to seep at the edges, the seepage can be controlled by the application of a silver nitrate stick, used cautiously.

4. Removal of the segment of tissue frequently exposes the incisal edge of the tooth. If so, the crown can be uncovered completely by the use of hand chisels or gouges, working away from the crown. When the incisal edge is not in evidence the bony process immediately over the tooth can be removed with the blunt-nosed ronguer. This instrument is also useful in getting rid of any of the enamel sac that remains.

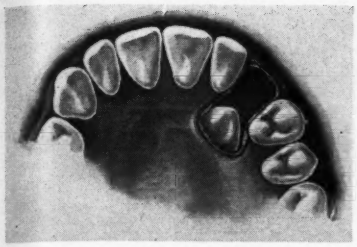


Fig. 3—The crown has been freed of surrounding tissues.

Packing the Cavity

1. In order to prevent the gingival tissue from creeping back over the tooth, a pack is placed in the cavity (Fig. 4) and allowed to remain as long as it will. These packs often will remain in place a week. The pack consists of cotton incorporated with surgical cement made up of zinc oxide, to which a small amount of powdered rosin has been added, and eugenol. The eugenol content of the pack will add to the patient's comfort. After the cavity is dried carefully, the pack is pressed into place with the finger tip and tamped down with a pledget of cotton moistened slightly with saliva.

2. The patient is instructed to return as soon as the pack begins to loosen. The edges of the wound are again touched up with silver nitrate, a painless procedure, the cavity is dried, and a new pack inserted. Usually this is all that needs to be done.

3. In stubborn cases, when the tooth does not erupt quickly, no harm is done if the tissue regenerates. Contrary to some opinions, this tissue is not hard to penetrate and the tooth generally will erupt despite it, once the bone is removed. It may be necessary sometimes to incise the gingiva when the tooth is about to break through. This can be done expeditiously by the application of phenol. The incision thus made is kept open for twenty-four hours by placing a small pledget of cotton, dipped in phenol, in the opening. These pledgets invariably fall out by themselves.

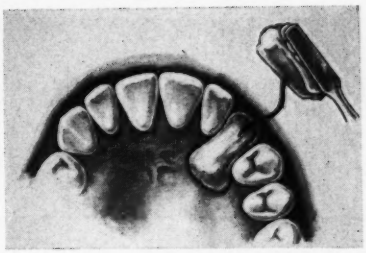


Fig. 4—Surgical cement applied to the area.

4. When the tooth is diverted too far palatally, so much so that it is erupting lingually to the lower arch, orthodontic treatment is necessary to bring it into its proper position. The point to be remembered is this: Experience has shown that this type of unerupted cuspid will erupt eventually without early orthodontic aid if given the opportunity to do so.

636 *Church Street.*

A Female Hemophiliac?

Lieutenant Commander (D) PHILIP A. CROW, L.D.S.

A WOMAN, aged 20, presented herself with an unsavable maxillary left second bicuspid. She stated that both she and her father were hemophiliacs. It was pointed out that normally the disease is incident only in the male and carried by the female. The patient was aware of this but insisted that she had been pronounced previously a hemophiliac. Accordingly a week's premedication with calcium lactate was given, and the extraction performed with a minimum displacement of tissue. Bleeding was at once profuse, and there was no evidence of even commencing fibrin formation. Pressure with a pad of gauze soaked in spirits of turpentine was maintained digitally for about half an hour without success.

The patient was admitted to the Sick Bay ward, and after a period of rest and warm mouthwashes, the socket was packed with adrenalin gauze, and a four-tail bandage used to maintain pressure. On removal thirty-six hours later, bleeding at once recommenced, and digital pressure was applied with a pad and tannic acid for ninety minutes. Success appeared to have resulted, but some hours later bleeding began again. A phial of Russell snake venom was obtained from a Naval hospital and applied with a pressure pad and bandage for four hours with success.

It is not practicable to ascertain whether the female patient is a carrier, but should this be so, the patient may well be in fact a hemophiliac in the light of Armstrong Davison's observations:

"Actually the disease is inherited from male and female alike according to strict Mendelian laws, modified only by the fact that the gene in question is borne upon the X-chromosome. The gene is recessive, and thus, if a female carrier marry a normal male, the chances are (if the number of offspring be sufficient) that half the male children will be bleeders and half the female children carriers. Should a hemophilic male marry a normal female, all the male offspring will be normal, and all the females, carriers. If, on the other hand, a hemophilic male marry a carrier female, the first filial generation will be composed of normal and hemophilic males in equal proportions, and carrier and hemophilic females, also in equal proportions. It will thus be seen that a hemophilic female is not an extraordinary phenomenon, but is the natural, though necessarily rare, outcome of the laws of heredity."

—From *The British Dental Journal*, 79:10 (July 6) 1945.

Clinical Diagnosis and Treatment of Palatally Impacted Cuspids

B. F. DEWEL, D.D.S., Evanston, Illinois

Following surgical removal of the overlying tissues, palatally impacted cuspids usually erupt of their own accord without the application of pin or inlay attachments. Thus unnecessary destruction of tooth material can be avoided in the great majority of cases by first permitting these submerged teeth the opportunity to erupt with no mechanical assistance other than surgery. Correction of any positional deviations can be accomplished thereafter by routine orthodontic procedures.

The history of a completed case, one of a group of cuspid impactions so treated, is given in detail, together with photographs and roentgenograms. Included are surgical requirements, appliance design, proper sequence of orthodontic measures, and general comments on the etiology and characteristics of these palatally impacted teeth.

CORRECTION OF palatally impacted cuspids frequently has involved pin or inlay attachments with a consequent destruction of tooth material for cavity preparation. While some form of orthodontic attachment may be necessary in a limited number of cases, it more often will be observed that these impacted teeth usually erupt with no mechanical assistance other than surgical dissection of the overlying palatal tissues. Obviously they may not proceed directly into normal occlusion, but neither do they do so when assisted by early orthodontic traction. If unsuccessful, moreover, such a procedure is not irremediable, for direct attachment can be applied just as readily after a second operation when any individual cuspid fails to respond as intended. Thus, by first permitting these submerged teeth the opportunity to erupt of their own accord, unnecessary tooth destruction can be avoided in the great majority of cases.

To supplement clinical observations on the general characteristics of this dental irregularity, a specific case for illustration has been selected from a series of cuspid impactions, all of which were treated in a similar manner. It was chosen because it presents most of the problems that arise in the diagnosis and treatment of these unerupted teeth. Both cuspids were involved, one of which was just beginning to erupt lingually to the adjacent lateral incisor while the other was deeply impacted with the crown lying at an angle immediately to the lingual of the neighboring lateral and central incisor roots. The laterals were rotated and in slight labial malposition, as may often be observed in these cases. The deciduous cuspid was still present on the side of the deep impaction, but its root demonstrated reasonably normal resorption, so much so that it could no longer deflect or prevent the eruption of the permanent cuspid.

Surgical Requirements

In these cases surgery includes not only uncovering the cuspid, but also enlarging the crypt surrounding the crown so that an excess of space is provided. Thus a channel slightly larger than the diameter of the crown will be created which will facilitate the downward movement of the tooth. It is, moreover, desirable to so locate the dissection of the palatal mucosa and overlying bone that the direction of the channel leads generally from the crown toward the alveolar ridge. Although as a rule direction of eruption is in line with the long axis of a tooth, by this provision the cuspid is encouraged to emerge favorably toward its normal position.

Proper surgical procedure requires a general excision of the overlying mucoperiosteum without injuring the gingival tissues surrounding the crowns of the neighboring teeth. A flap is not only laid back; it is completely eliminated. The bony covering can then be removed, with due care, of course, for the roots of any adjacent teeth. One surface of the crown and all the incisal edge should be uncovered, and the enamel sac over the exposed area also should be removed. The principle is possibly the same as when any other tooth requires no more than simple lancing to permit or assist it to move into occlusion. Elimination of the bone structure is merely a further step which is usually necessary in cuspid impactions. Once freed of the overlying restraining tissues, these teeth are no longer prevented from erupting at a normal rate. After complete exposure of the submerged tooth, the resulting channel must be packed carefully with a surgical dressing material to maintain the opening until healing is well under way.

Eruption of the cuspid thereafter follows as a result of its own inherent eruptive ability, usually in the general direction prepared by the channel. It is well not to be impatient, for even under normal circumstances upper cuspids erupt slowly. From 4 to 6 months may be required for these teeth to move into a position favorable for the application of a simple orthodontic attachment which does not involve tooth destruction.

Fig. 1—This is the first of a series of photographs illustrating the sequence of events in the correction of a palatally impacted right cuspid. It shows the case as it originally appeared before treatment.

Fig. 2—Surgical removal of the mucoperiosteum and palatal bone structure overlying the cuspid was accomplished 5 months prior to this photograph. The tooth erupted with no assistance other than surgery.

During this period other orthodontic procedures may be undertaken, particularly in the preparation of sufficient space for the later reception of the cuspids in their normal positions between the lateral incisors and first bicuspids.

This process may involve expansion of the arches in the bicuspid region, a distal movement of the posterior teeth, or closing any associated spaces between the anterior teeth. These procedures are necessary not only to secure proper space for the cuspid, but also because the area to be provided must originally be somewhat greater than the width of the cuspid. This is purely for mechanical advantage, since slightly greater space is required when carrying any object from within an arch or circle to a position outside those limits. This increase in space is so slight that it will close of its own accord on the removal of all orthodontic tension. The greatest care must be used at this time, however, in any attachment to the incisor teeth, especially the laterals, because of the proximity of the roots of these teeth to the crowns of the erupting cuspids. Ordinarily correction of any malposition of the lateral incisors should be delayed until the cuspids are in reasonably normal alinement with the rest of the upper teeth.

Objections to Fixed Attachments

Preparing a cavity for the reception of a pin or inlay is undesirable because of appearance, destruction of

Fig. 3—Intraoral roentgenograms provided partial evidence of the position of the impacted right cuspid (left). These were supplemented by occlusal views, as shown in Figure 7. Stereoroentgenograms were not necessary in this case.

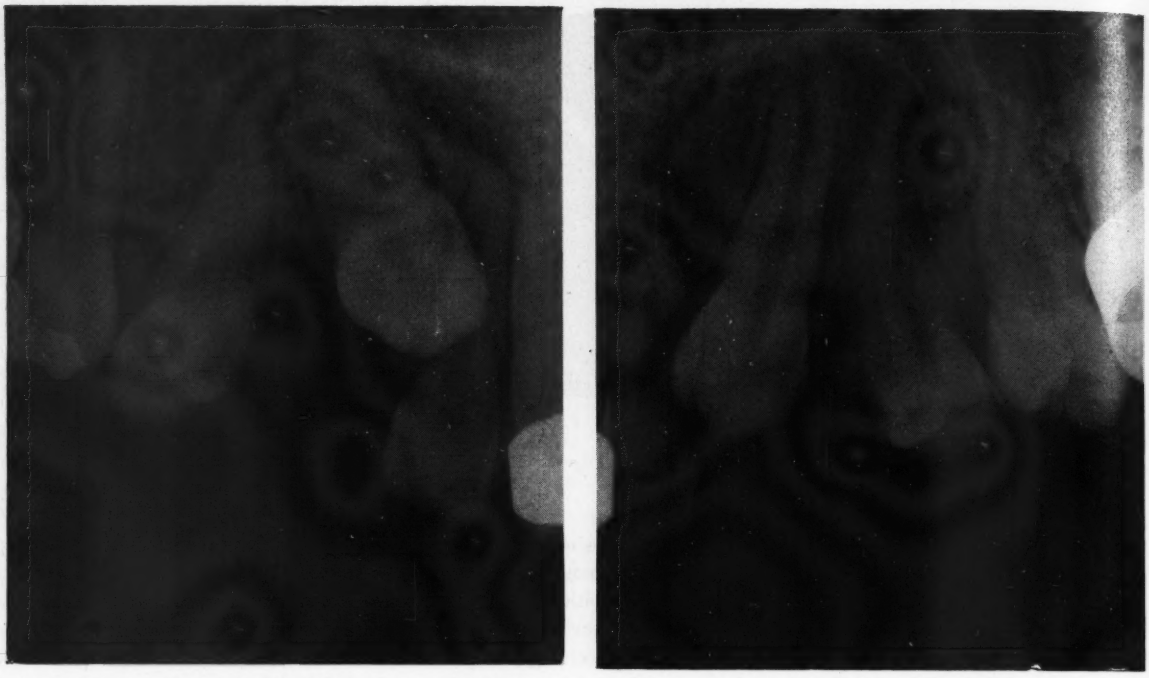


Fig. 4—These roentgenograms and the photograph shown in Figure 2 were taken on the same day. Note the improvement in the new position and inclination of the right cuspid (left) in comparison with the original roentgenograms.

tooth material, and possible pulp involvement. The cavity is rarely located inconspicuously on the lingual aspect of the tooth since the impacted cuspid ordinarily presents an oblique position with the crown inclining toward the palate and the root toward the vestibule. In assuming such an inclination, the lingual surface automatically swings upward into an inaccessible position facing the nasal cavity and away from the oral cavity. With only a small area of the tooth exposed to view, and this in a deep hemorrhagic field of operation, it is difficult to determine the exact location of the proposed excavation. Even a shallow cavity in certain areas in an immature tooth may result in pulp involvement, and this irritation may be aggravated by too sudden tooth movement if excessive traction is applied.

If an attachment ultimately is required, it is better first to attempt securing to the exposed surface of the tooth a section of coiled brass wire terminating in an eyelet for ligature insertion, using black copper cement for fixation. Finger springs generally are not acceptable because of the difficulty in controlling the free end of a spring on an inclined surface of a tooth. None of these methods is necessary in the great majority of cases, however, since most of these cuspids will erupt with no assistance when once freed of the overlying hard and soft tissues of the palate.

Prior to surgery, thorough roentgenographic examination is of the greatest importance. The usual intraoral views, although necessary, are not sufficient for a complete diagnosis. They must be supplemented by occlusal roentgenograms which will locate more accurately the impacted cuspids in relation to the other anterior teeth, particularly in those cases where visual examination or palpation fail to indicate whether the unerupted cuspids are in lingual or in labial malposition. If a cuspid is deeply impacted at a level parallel with the apexes of the central and lateral roots, stereoroentgenograms are essential if the tooth is to be located with accuracy.

Specific Case Analysis

The condition as originally observed in the specific case under consideration is illustrated in Figure 1. The tip of the left cuspid can be seen immediately to the lingual of the left lateral incisor. The position of the impacted right cuspid somewhat to the lingual of the right central and lateral incisor roots is indicated by a slight fullness or prominence in the palate, a condition that is lacking entirely in the right vestibule in the area which ordinarily shows a cuspid eminence. With the exception of the impacted cuspids and the rotated lateral incisors, the case presented good arch form and normal mesiodistal occlusion of the teeth.

Delayed resorption of the deciduous cuspids probably had been the original cause of the abnormality. Although the patient, a girl, was 12½ years of age when the correction was undertaken, one of these teeth was still in position while the other had but recently been lost. At least a normal rate of eruption of the permanent cuspids in this particular case was indicated by the early eruption and loss of all the deciduous teeth other than the retained deciduous cuspids, and by the early appearance of all the permanent teeth other than the impacted cuspids. Thus delayed resorption of the roots of the

deciduous cuspids in an otherwise early eruptive schedule may well have caused the normally erupting permanent cuspids to be deflected to the lingual, whereupon they simply continued in that direction. Also of etiologic interest in this patient was an underdeveloped right nostril, this on the same side as the deeply impacted cuspid. The nose exhibited a slight curvature with the concavity also on the right. With the exception of a seasonal hay fever and the removal of the tonsils and adenoids at the age of 7, there were no other diagnostic symptoms of importance.

Five months elapsed between the surgery and the photograph shown in Figure 2, during which the right cuspid erupted with no assistance to the position illustrated. Note that, in comparison with the original position of the tooth as shown in the roentgenograms (Fig. 3), this cuspid in erupting of its own accord appears to have improved its position by migrating distally and buccally as it moved occlusally. It is doubtful that traction by direct attachment could have done better. Observe also that the left cuspid showed only slight evidence of further eruption during this period (Fig. 4); additional downward growth had been interrupted by occlusal interference with the lower cuspid. The right deciduous cuspid had been extracted at the same time that the right permanent cuspid was uncovered.

At this time it was possible to provide cast overlays or caps which carried staples for the insertion of traction ligatures. These are simple gold castings made on models secured from plaster impressions. They need be no thicker than the thinnest gauge casting wax, and cover only the exposed portions of the teeth. With their use, there is no mutilation of tooth material.

The staples are soldered ordinarily on the lingual aspect of the caps, and spurs are placed on the mesial and distal surfaces to prevent the ligature wires from slipping occlusally. Occasionally these caps will loosen, but this happens more rarely than ordinarily would be expected, particularly when the castings are accurate. Use of a staple rather than a lingual hook is good insurance against loss. If the cap does become dislodged it will not be swallowed or lost because of the secure attachment of the cap to the ligature, and in turn, the ligature to the archwire.

Mechanics of Treatment

Traction is applied by ligating the caps to the archwire. It is important that the archwire be stabilized anteriorly by an attachment to bands on the central incisors. Otherwise it will tend to be displaced gingivally or occlusally, depending on the direction of pressure, as traction is applied to the cuspids by means of the ligatures. This would result in lack of control of the direction of pull on the cuspid, and in undesirable loosening or tipping of the molar anchorage. Ideally, however, the archwire should rest passively in the molar tubes and central incisor attachments while the cuspids are being moved buccally in order to avoid abnormal movement of any of these teeth.

It is also advisable to place hooks on the archwire to maintain the ligatures in a fixed position so that the teeth will be carried in the direction desired. Otherwise the ligatures will slip forward to an unfavorable position along the curved segment of the archwire. Figure 5 illustrates all these attachments: bands, caps with staples and spurs, archwire with ligature hooks, and ligatures so applied that distal as well as buccal cuspid movement will be achieved.

The time involved in moving the left cuspid into buccal occlusion with the lower cuspid was 3 months, while the right cuspid, which had farther to travel, required 4½ months. Ligature pressure was renewed at 10-day intervals. Although these patients report little discomfort from cuspal interference with the lower teeth as the cuspids cross from lingual to buccal occlusion, the ligatures ordinarily are tightened somewhat more frequently when the upper cuspids move far enough to strike the lower teeth when the jaws are closed.

Almost invariably, cuspids in this form of malocclusion are not only palatally impacted but also are rotated. Little or no attempt is made to rotate them into normal position until after they have been carried buccally to the lower teeth. Before doing so they are given a rest period so

Fig. 5—Ligature traction applied to cast caps was used to carry the cuspids buccally, after which rotation was accomplished by standard orthodontic procedures.

Fig. 6—Normal arch form and tooth position are illustrated in this photograph taken after the removal of all appliances. The case was self-retentive.

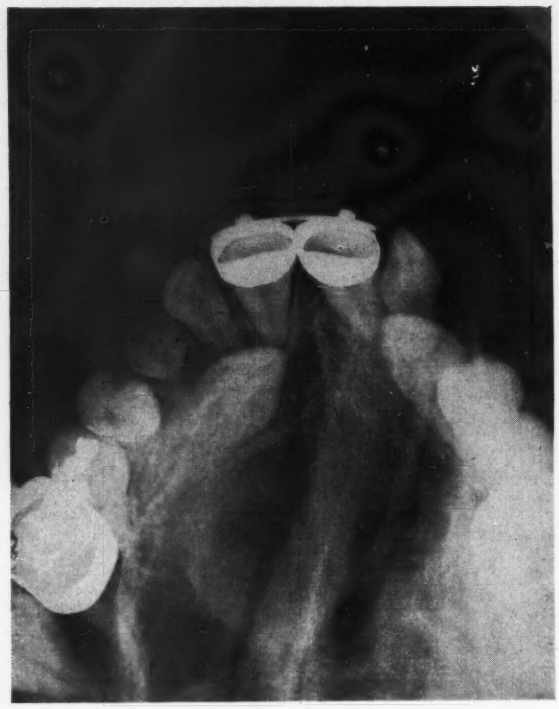


Fig. 7—This occlusal roentgenogram, when compared with the intraoral views at the beginning of treatment, completed the diagnosis of the palatal impaction.

Fig. 8—Normal arch form and final alinement of the teeth are illustrated in this occlusal roentgenogram taken 18 months after the completion of treatment.

that the supporting structures can accommodate themselves to the new positions of the teeth. During this interval the cuspids also have the time to erupt further and the gingival tissue has an opportunity to assume a normal position around the crowns.

The rest period in this case extended for 2 months, after which standard orthodontic rotating bands with lingual hooks were placed on both cuspids. Rotation and final cuspid alinement were accomplished by ligature traction and required 5 months, approximately the same as was necessary in moving these teeth from lingual to buccal occlusion. Not until this was nearly completed were bands placed to improve the position of the lateral incisors. This latter process involved 3 months. Arch form and final tooth positions are shown in Figure 6, secured 2 months after the treatment was completed. No retention was placed, since a final rest period indicated none was necessary. Figures 7 and 8 are the original and final occlusal roentgenograms of the maxillary arch. Figures 9 and 10 illustrate anterior views of the teeth in occlusion at the beginning and at the end of treatment. Time involved in active treatment was 17 months; including all rest periods, 20 months.

Impacted Cuspid Characteristics

A curious sidelight on these palatally impacted cuspids is that they seem to occur most often in cases which otherwise present quite normal arch form and occlusion of the teeth. Usually there is almost enough space to accommodate them in their normal positions between the lateral incisors and first bicuspids. Thus the cause of the abnormality cannot be placed on crowded or contracted arches. Since this is true, another characteristic that is thereby made more difficult to explain is the greater frequency of impacted cuspids in females than in males,[1] a trait which otherwise could be dismissed more easily by simply attributing it to the smaller and more delicate feminine facial anatomy.

For other reasons it is strange that these maxillary cuspid deviations should occur so often; in order of frequency the cuspid impaction is second only to that of the mandibular third molar, a tooth which in contrast is relatively unimportant, structurally deficient, and occasionally absent. That Nature considers the cuspid virtually indispensable is indicated in the fact that it is almost never congenitally absent. Furthermore, the cuspid is surely one of the most sturdy of all the teeth with the exception of the first permanent molar; hence it is odd that it should have so much difficulty in achieving its normal position in the dental arch. Its long powerful root indicates that it is a principal unit of the dental organism, with the responsibility of guiding the lateral movements of the mandible and of carrying a good part of the load of mastication. It is the final factor in completing arch form and in securing contacting relations among all the teeth. And esthetically its strategic position at the angle of the arch is significant in the maintenance of

[1]Rohrer, Alfred: Displaced and Impacted Canines, Internat. J. Orthodont., Oral Surg., & Radiography, 15:1003 (October) 1929.

harmony and symmetry of occlusal relationship and in determining the contours of the mouth as a whole.

There are other pertinent observations in regard to this irregularity. Cuspid impactions occur more frequently in the maxilla than in the mandible. The upper cuspid is displaced lingually more often than labially while the reverse is true with the lower tooth. Either condition is rare in the deciduous dentition. When impacted lingually, the upper cuspid is usually rotated and occupies an oblique or partly horizontal position. Occasionally the enamel sac surrounding the crown may appear cystic, but this does not interfere with surgery or subsequent eruption. An example of this may be seen in the circumscribed and rarefied area surrounding the right cuspid in the roentgenograms shown in Figures 3 and 7.

A slight labial malposition and rotation of the lateral incisors is usually associated with the impaction; this symptom is of diagnostic importance prior to roentgenographic examination when any cuspid remains unerupted after the age of 12. Early treatment thereafter is advantageous, for all the natural eruptive forces favor the downward movement of the tooth at this time, it being the age in which these teeth ordinarily emerge into the dental arch. The longer surgical and orthodontic treatment is delayed after the normal time for eruption has passed, the greater the difficulty in assisting these teeth into normal occlusion. The chief cause of failure, however, rests with those cuspids which are so highly and horizontally placed that the incisal edges cannot be released or freed from a position above the lateral or central incisor roots without endangering these latter teeth.

Etiologic Factors

It is possible that the full penetration of lingually impacted cuspids is retarded by the different character and increased density of the tissues forming the palate. That the soft tissues of this area offer effective resistance is indicated by what histologists describe as the dense structure and firm attachment of the entire palatal mucosa.[2] Whereas the tissue covering the crest of the alveolar ridge is characterized as firm and resistant, that covering the anterior part of the hard palate is described as very dense, thick, and resistant.[3] It is also probably true that the palatal bone is less receptive to dental eruptive processes than the alveolar type overlying the ridge which was specifically designed for the purpose. If, moreover, eruption is in any way dependent on an associated increase in apical development, then minimum assistance is given by the cuspid for its root normally is more advanced on eruption than is the case with other permanent teeth. Thus, because of a difference in tissue character and root development, these deflected cuspids frequently are unable to penetrate the dense hard and soft structures of the palate. But once freed of the overlying restraining tissues, they soon resume eruption at a normal rate.

Possibly the original cause of the cuspid impaction lies in the extent of eruption required of these teeth. Opportunity for deflection from a normal course increases in proportion to the distance a tooth must travel from its area of development to full occlusion. The upper cuspid originates at a much higher level than other teeth, its tooth bud lying above the apical plane of the incisors and bicuspids well up in the region between the nasal cavity and the maxillary sinus. Usually the base of its crypt is at a slightly higher level than the floor of the nasal cavity and so located that it is braced against the solid bone at the lower border of the malar process.[4] It is still deep in the bony process of the maxilla when the first bicuspid is erupting. In contrast, teeth which develop comparatively close to the surface do not have, in the shorter distance they need to travel, as great an opportunity for directional deviation as that of the deeply placed cuspids. Although full eruption normally occurs just at the union of the maxillary and premaxillary bones, there is no conclusive evidence that this suture area might also be an etiologic factor in the malposition of these teeth.

(*Continued on page* 500)

[2]Orban, Balint: Oral Histology and Embryology, St. Louis, C. V. Mosby Company, 1944, page 268.
[3]Kronfeld, Rudolf: Histopathology of the Teeth and Their Surrounding Structures, Philadelphia, Lea and Febiger, 1933, page 448.

[4]Noyes, F. B.: Dental Histology and Embryology, ed. 4, Philadelphia, Lea and Febiger, 1929, pages 368 to 381.

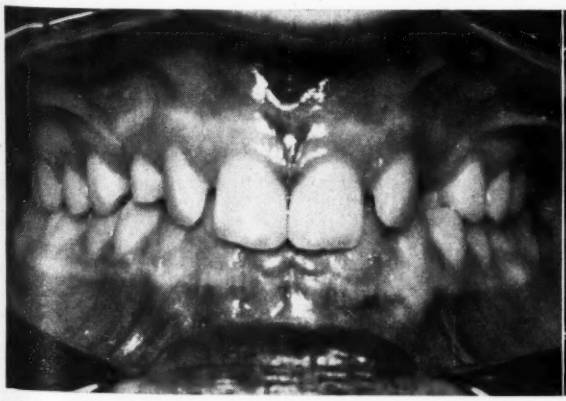


Fig. 9—This photograph illustrates the case at the beginning of treatment. Compare with Figure 1.

Fig. 10—Final tooth position 2 months after the removal of all appliances. Compare with Figure 6.

The Roofless Denture

LOUIS A. HAWKES, D.D.S., Pittsburgh

A technique for obtaining the necessary postseal in a roofless denture is described. The technique involves the accurate determination of the margin of the roofless denture, and the method of obtaining the inner seal by the use of grooves around the margin which adjust and adhere to the palatal tissues.

THE MANY LETTERS asking for a detailed technique for making a roofless denture warrant a republication on the subject[1] to satisfy a seemingly growing interest. I have made and worn thirty-seven dentures, both upper and lower. In my experiments I have found that if the upper denture is made with the palate covered, a heavy mucous accumulation is detected within two days. On removal of the palatal part of the denture, the condition disappears as readily. Postdaming produces the same result as does the palatal covering. This raises the question: Are postdaming and palate covering unnecessary infringements?

It must be kept in mind that these are my personal experiences, that no two mouths are alike, and that my experiences may not be a criterion. Since 1896, when I made my first denture for myself, I have had the advantage of personal experience. I am satisfied that when other dentists themselves are compelled to wear dentures, their opinions in regard to the roofless denture will change.

Advantages

Six advantages of roofless dentures are offered:

1. Keener tasting ability.
2. Sensations of thermal change.
3. Less bulk and more tongue room.
4. Relief from gagging.
5. Ideal for patients with palatal protruberance.

Fig. 1—Model with the proper grooves for retention.

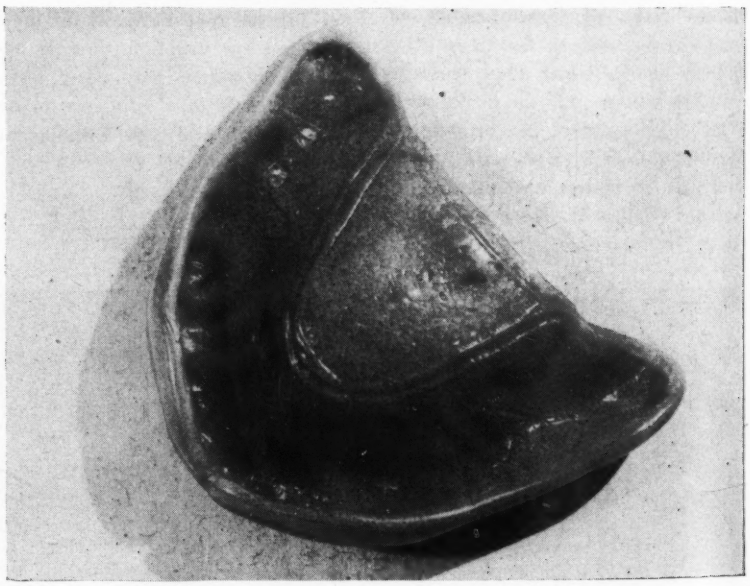


Fig. 2—Denture to be worn for thirty days before removal of the palatal part.

[1]Hawkes, L. A.: Roofless Dentures, THE DENTAL DIGEST, 39:326 (September) 1933.

6. Prevention of pressure on postpalatine nerves.

Determining the Palatal Margin

The secret of success of any denture is postseal, the main objective in postdaming. If a perfect seal can be obtained, avoiding the hard center of the palate, that seems the logical method.

1. To determine the proper location of the roofless denture margin, finger pressure on the ridge about the first molar region will show a certain degree of indentation, probably only slight but extremely important. Persons who wear dentures know that pressure against a denture causes a slight movement, a cushioning effect, and that release of the pressure allows the denture to resume a resting position. This pressure and release movement is continuous during mastication. It is reasonable to expect that the inner margin (A in Fig. 1) will react in the same manner. The same degree of movement must register on both the ridges and the central margin.

2. To determine the right location of the inner seal, indent the ridge with the finger, then slowly continue indentation from the ridge toward the center of the palate. It will be noticed that the indentation increases, then gradually decreases until the indentation ceases over the center of the palate.

3. If the inner margin (A in Fig. 1) is properly placed, the seal will not give way on release of pressure. This margin should be outlined in pencil on the model. A second groove about 2 millimeters deep (B in Fig. 1) must be cut about $\frac{1}{8}$ inch inward from this line. Another groove (C in Fig. 1), must be cut about $\frac{3}{16}$ inch from and parallel to the second groove. Cuts such as these would leave two lines protruding into the tissues and would cause soreness. As soon as the lines are cut, they should be widened at the top with an instrument, such as the small end of a wax spatula. The base of the line is thus widened. In the finished denture the tops of the lines are polished down a little to prevent soreness; this will leave a rounded edge instead of a sharp line to irritate the tissue. A groove about 2 millimeters deep is cut between the second two lines (B and C in Fig. 1), using a large round bur. These two lines should connect at each end. The tissues eventually will fill this groove to complete the seal. The roof of the mouth will show the indentation of these lines after a month's wearing.

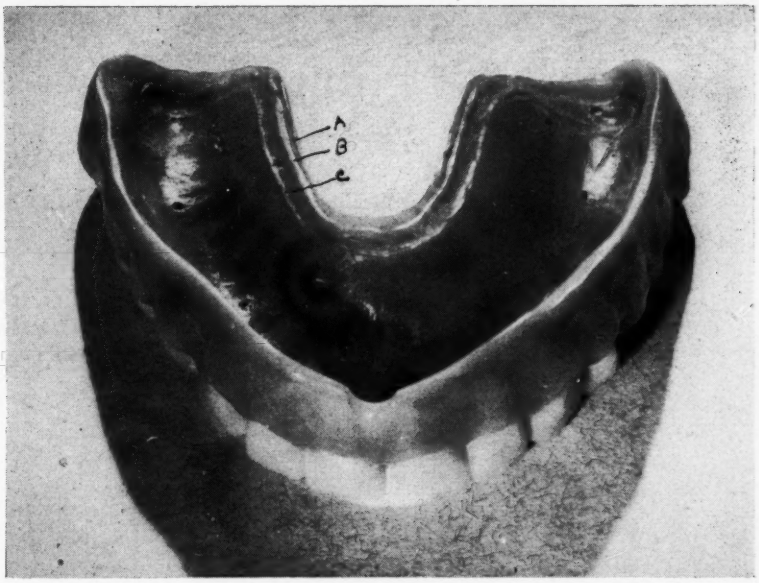


Fig. 3—Palatal part removed. Note the relation of the margin, the two seal lines protruding into the mucous membrane, and the groove between.

4. I advocate the use of a denture powder for the first few weeks. There are two reasons for this: (a) To hold the denture in place in the mouth while the seal lines indent the palatal tissues, and (b) to stimulate a state of resistance under the mucous membrane where it is needed. The denture should be worn without removal for the first forty-eight hours.

5. When the denture is first inserted, the palatal part is not removed; the denture is to be worn for the first month with this part in place (Fig. 2). Thus the patient will realize the difference and the advantages

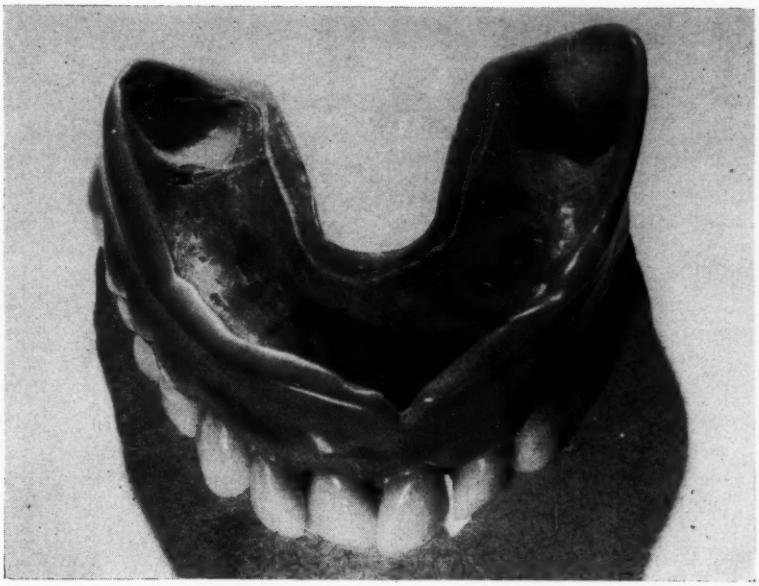


Fig. 4—A single seal line surrounding the tuberosities is sufficient for successful retention.

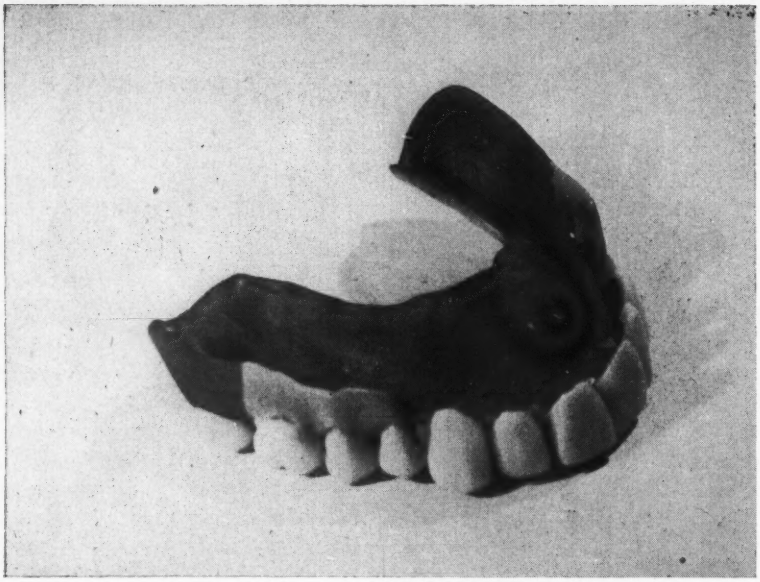


Fig. 5—An unusual case: Owing to high lifting of the lip on laughing, the tissues showed above the denture margin. The six anterior teeth are made up in a bridge with steel facings, and a bar extension runs back to the molar regions with the balance of the denture built upon it. The denture has been worn satisfactorily for six years. Note that there is no denture material above the six anterior teeth.

of the roofless denture after the roof of the denture is finally removed.

6. Remove the palatal part of the denture up to ⅛ inch of the second line (B in Fig. 2) after thirty days. Taper the edge neatly and polish. Insert the denture in place, well powdered, and ask the patient to drink ice water. The sensation is startling.

7. The success of a roofless denture depends on several factors outside itself: (a) There must be lower molar opposition on each side of the mouth, and (b) there must be balanced occlusion and smooth lower jaw excursions with no tripping.

Comments

Many patients for whom I have made roofless dentures have returned later for another denture; each has insisted on a roofless denture. The patient for whom I made his first roofless denture in 1923 is now wearing his second.

Although students in some dental schools have been warned openly against making roofless dentures, the results to date prove beyond a doubt that the roofless denture is practical and is appreciated by the wearers. My critics, entitled to their own opinions, of course, are men who do not wear dentures; their theories will undergo change when they too must wear them.

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Clinical Diagnosis and Treatment of Palatally Impacted Cuspids

(*Continued from page* 497)

Of greater importance is the fact that in its development the permanent cuspid crown lies immediately to the lingual of the apex of the long deciduous cuspid root. Any change in the position of the deciduous cuspid crown because of caries or premature loss of the deciduous molars is reflected along its full length to the end of its root, and may thereby easily cause a deviation in the position and direction of growth of the permanent tooth bud. Delayed resorption of the deciduous cuspid root likewise may divert the advancing permanent tooth.

The time element in eruption is also an etiologic factor in cuspid impactions. These are the teeth that are normally late in eruption and are, therefore, the ones most likely to be susceptible to impaction because they are vulnerable for a longer period of time to any unfavorable environmental influences. Teeth that are late in appearing, moreover, have a greater responsibility in preparing their own way into the dental arch. The cuspids are the last of the permanent teeth to erupt which are preceded by one of the deciduous teeth. They erupt between teeth already established in occlusion, and in time of appearance are competing for space with the also currently erupting second molars. Furthermore, in contrast to the bicuspids which replace teeth equal to or greater than their mesiodistal diameters, the cuspid is preceded by a deciduous tooth which is in no manner its equal in width. For these reasons any factor which interferes with the position of the tooth germ or retards development in the cuspid region immediately results in a tendency to impaction.

708 *Church Street.*

The Present-Day Concept of Vincent's Infection

(Conclusion)

HOWARD A. HARTMAN, D.D.S., Cleveland

This is the second of two articles on Vincent's infection. The first (August) discussed the symptoms, the etiologic factors, and the accurate diagnosis of the condition by a careful consideration of the histopathologic factors involved and the roentgenologic and clinical findings.

This article considers the differential diagnosis, comparing the factors involved in Vincent's with those in marginal gingivitis and marginal periodontitis, and the technique of treatment in eliminating the infection. Emphasis is placed on the maintenance of a healthy mouth to prevent a recurrence of the symptoms after the disease is under control.

Fig. 9—Immediate scaling, a prime requisite in the treatment of any periodontal disturbance, particularly Vincent's infection.

Comparison With Other Oral Conditions

As was mentioned previously, we must distinguish between Vincent's infections and oral manifestations of systemic diseases. It is likewise quite important to differentiate between marginal gingivitis and marginal periodontitis. In distinguishing Vincent's from these two oral diseases, the following factors are important:

1. In Vincent's there is continual pain on mastication. In marginal gingivitis there is no pain. In marginal periodontitis there is a gnawing pain.

2. In Vincent's there is no feeling of elongation. In marginal periodontitis there is a feeling of elongation.

3. In Vincent's there is hemorrhage on disturbance of the pseudomembrane. In marginal periodontitis and marginal gingivitis there is hemorrhage only on pressure, for there is no pseudomembrane.

4. In Vincent's there is an increase in salivation, accompanied by a metallic taste. Neither is evident in marginal periodontitis or marginal gingivitis.

5. In Vincent's there is a characteristic fetid odor not found in either of the other two infections.

Fig. 10—Superoxol or concentrated hydrogen peroxide spray to rid pockets and lesions of debris and any other foreign material.

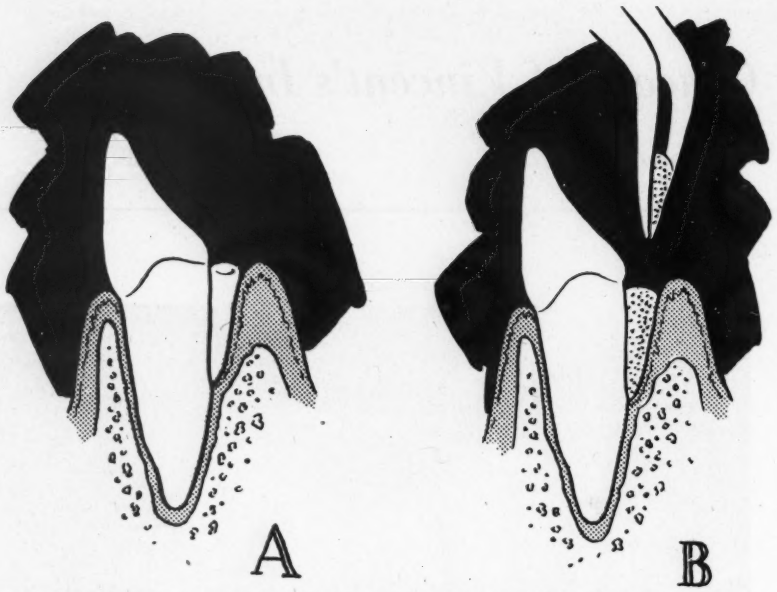

Fig. 11—Methods of applying liquid medicaments to pockets or lesions: (A) Insertion of miniature cotton roll soaked with medicament directly into dried and isolated pocket. (B) Medicament inserted by means of beaks of cotton pliers.

6. In Vincent's there is a rise in temperature, accompanied by general malaise. These are not present in marginal periodontitis or marginal gingivitis.

7. In marginal gingivitis the free gingival margin is swollen. In marginal periodontitis it is cyanotic. In Vincent's the gingivae are blood red and grayish.

8. Marginal gingivitis has no erosion. Marginal periodontitis has some erosion. In Vincent's the interdental papillae are swollen, ulcerated, and painful.

9. Marginal gingivitis is characterized by a certain degree of pus formation. Marginal periodontitis presents pus formation in a lesser degree. In Vincent's there is no pus, no purulent exudate, but there is a pseudomembrane.

10. In Vincent's—and this is important—the onslaught is sudden. In the other two diseases it is slow and insidious.

Fig. 12—Condition after three applications of Adams technique accompanied by conservative but thorough scaling at each treatment.

Treatment

Having effected a diagnosis through consideration of the clinical symptoms, by microscopic examination, and by a study of full-mouth roentgenograms and the patient's medical history, we come to the task of eliminating the infection. In our consideration of the etiology of Vincent's, we established as contributory factors poor oral hygiene, faulty dentistry, irritants, both mechanical and chemical, lack of sufficient rest, and avitaminosis C. The first step in treatment is the alleviation of these causes. This may be accomplished by:

1. The elimination of calcareous deposits and other mechanical irritants.

2. Correction of faulty bridges, overhanging crowns, and restorations.

3. Instruction in home care to the patient:

a) Abstinence from the use of alcohol, tobacco, and sharp condiments.

b) Increased rest.

c) A well balanced but conservative diet.

d) A greatly increased vitamin C intake, either by means of orange juice or by the consumption of ascorbic acid. (Ascorbic acid dosage: 100 to 200 milligrams after each meal, plus 100 to 200 milligrams at bedtime).

Elimination of Irritants—The first step is the elimination of all irritants by means of careful scaling of the teeth (Fig. 9). No attempt should be made to remove all the calculus at the first treatment, but just the sharp, irritating spicules of the calcareous deposits. Conservative scaling should be continued on subsequent visits. Particular attention should be given to the removal of debris. One of the best ways to remove the debris and the membrane is by the use of superoxol (neutralized with 5 per cent sodium bicarbonate) or concentrated hydrogen peroxide as a spray (Fig. 10). The spraying of a dried lesion with superoxol accomplishes several things, primarily the removal of debris and detritus through the effervescent nature of this liquid.

Following this process, a variety of

medicaments may be applied (Fig. 11). Some men like the topical application of mepharsen, neoarsphenamine, and others of the same family. A popular and effective treatment is the Adams technique, which consists of the application of Churchill's iodine to the cleaned, dried, and isolated lesions. They are then dried again and 10 per cent silver nitrate is applied. This accomplishes two things:

1. Bactericidal action.
2. Precipitation of potassium iodide which acts as a coating over the lesion and consequently reduces pain.

The second day's treatment is exactly the same as that of the first. The lesions are again sprayed with superoxol, isolated, and the Adams technique is repeated.

The third day's treatment is exactly the same as that of the first and second. Usually following three applications of the Adams technique, there is a marked improvement in both the patient's condition and in the oral picture (Fig. 12). Unless progress is not as marked as shown in the illustration, the patient's next visit may be forty-eight hours later. At that time the conservative scaling should be repeated, and one of the dyes, preferably 2 per cent gentian violet (Fig. 13), should be applied. At that time a negative smear should be obtained and a healed lesion presented.

Many treatments have been formulated for combating Vincent's infection (Fig. 14). Most of them primarily promote relief from pain by either their chemical action on the lesion or by the coating which is precipitated thereon. It is interesting to note that in a large number of cases handled both in the hospital and in the office a relatively thorough scaling, removal of all debris, either by the use of peroxide, superoxol, or other means of irrigation, and the application of a surgical dressing (Fig. 15) over these lesions, are ample treatment to arrest and eliminate the infection. This must be accompanied by an increase in vitamin C consumption, plus an ample amount of rest.

Dental Treatment—In order to bring about a 100 per cent recovery

Fig. 13—Application of 2 per cent gentian violet to dried lesion by means of beaks of cotton pliers.

Fig. 14—Typical lesions of acute Vincent's infection.

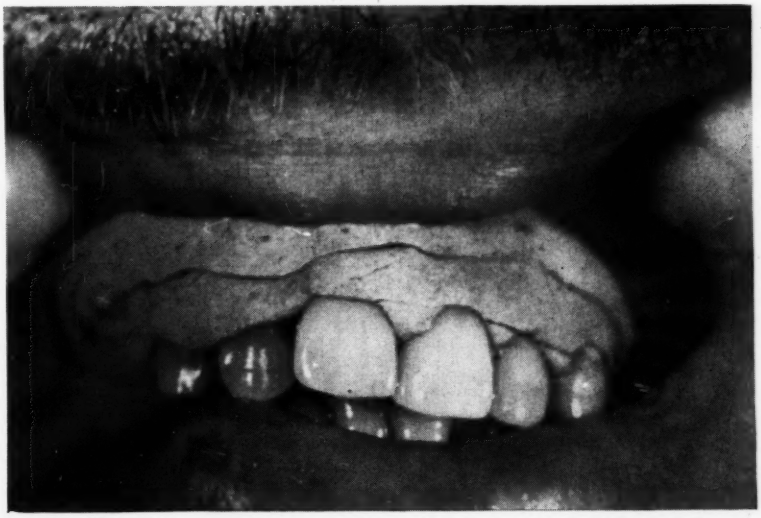

Fig. 15—Surgical pack applied to lesions which have been cleaned of debris with superoxol or peroxide and treated with gentian violet or acriviolet. The pack isolates the lesions and prevents irritation by smoking or irritating foods and beverages.

Fig. 16—Recurrent attacks of acute Vincent's infection. Note the destruction of the alveolar crest and interdental papillae.

Fig. 17—Recurrent attacks of acute Vincent's infection. Note the destruction of the alveolar crest and interdental papillae. Microscopic examination of pocket contents revealed streptococci, staphylococci, and hay bacilli. Vincent's organisms were almost absent.

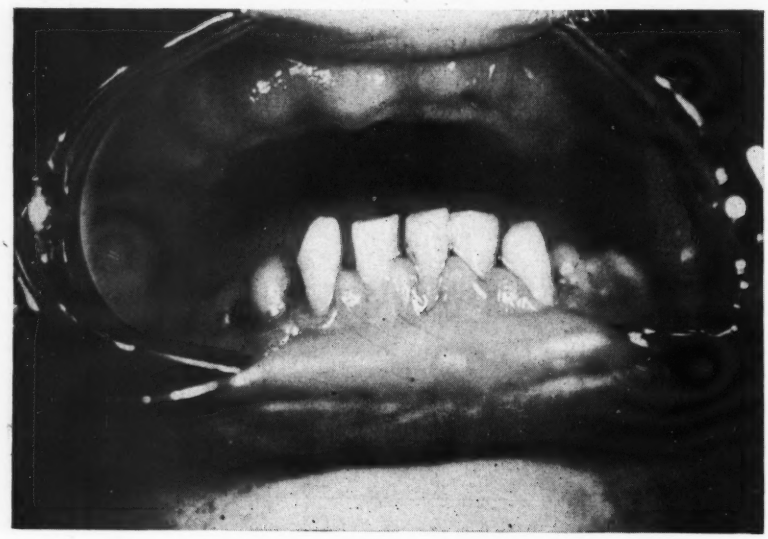

Fig. 18—Hypertrophic gingivitis with a history of previous attacks of acute Vincent's infection.

and to prevent any possibility of recurrence (Figs. 16 and 17), a complete program of oral rehabilitation should be instituted. This may be effected in the following manner:

1. The removal of all roots, third molars with their incumbent crypts, pockets, and opercula, which are always found, particularly in the case of impactions.

2. The elimination of caries, overhanging restorations, and ill-fitting jacket crowns.

3. The correction of traumatic occlusion, insofar as the patient's natural teeth are concerned.

4. The elimination of all periodontal lesions, particularly pockets, and the calculus that is therein contained, if there is any remaining after treatment for the acute symptoms of Vincent's. The elimination of these pockets may be accomplished by several methods, among which are the following:

a) Conservative Treatment: The use of astringents and mild oxidizing agents to cause a normal gingival crevice. This may be considered as chemosurgery. Although this is called a conservative method, it has the disadvantage that the degree of destruction secured cannot be controlled.

b) Electrocoagulation: This means of tissue elimination naturally relieves the patient of the ordeal of surgery. Although it has the advantage of necessitating no cutting, however, it cannot be controlled insofar as the depth of coagulation is concerned. There may be a coagulation of the alveolar process and a consequent localized osteomyelitis. There is always a certain amount of pain following this method of pocket elimination.

c) Pocket Elimination by Surgery: By this technique the operator has absolute control of the amount of tissue eliminated. The deeper structures, the alveolar process, and the deeper normal periodontal fibers, are not involved. There is a relatively small amount of pain following employment of this technique. It is the most desirable method of pocket elimination (Figs. 18 and 19).

5. Following the elimination of

periodontal pockets, it is essential that any and all traumatic relationships be corrected. This is to be instituted and consumated in a relatively conservative fashion. Cusps should not be destroyed nor eliminated; however, cuspal interference should be relieved.

6. Prosthetic appliances should be constructed and placed to accomplish:

a) Restoration of missing teeth, consequently relieving the pressure and strain on the remaining ones.

b) Necessary stimulation and the promotion of supporting structure health.

c) Provision of adequate masticatory service.

Home Care—The success of the office treatment is directly dependent upon accompanying home care. This cannot be overemphasized to the patient. It consists of establishment of good oral hygiene, a conservative, well balanced diet, a greatly increased intake of vitamin C, adequate rest, abstinence from use of irritants, and the conservative use of cathartics.

The prognosis, as we may interpret it, means not only recovery from the acute Vincent's infection, but also the outlook of a patient after a serious infection or illness. After recovery of the patient from the acute symptoms has been effected, the next factor is to prevent a recurrence of this infection. This in itself is the prognosis, prognosis meaning recovery, outlook, and, from the layman's point of view, the day when fear of the recurrence will be entirely eliminated. This is perhaps the most important phase of the entire picture of prognosis.

It is the duty and obligation of the general practitioner or specialist to his patient to educate him in the art and science of maintaining a high degree of oral hygiene. This is vitally important, not only from the point of view of oral hygiene, but also from that of tissue stimulation (Figs. 20, 21, and 22).

There are several acceptable methods of toothbrushing. Toothbrushing in itself is of little consequence unless the supporting structures are massaged and stimulated. A modified Chartres technique is an acceptable

Fig. 19—Condition after surgical elimination of hypertrophic tissue and eradication of periodontal pockets.

Fig. 20—Proper technique for brushing the buccal surfaces of the lower molars. The illustration shows the end of an upward stroke, which starts at the gingival margin and moves occlusally.

Fig. 21—Proper technique for brushing the lingual surfaces of the teeth, starting the stroke at the gingival margin and carrying it to the incisal. The illustration depicts the end of the stroke in brushing the anterior teeth.

method. Research work conducted under the direction of Hamilton B. G. Robinson at Ohio State University indicates that indiscriminate and overvigorous brushing may cause not only periodontal tissue destruction, but also abrasion of the cervixes of the teeth. The patient should be advised to brush and stimulate the supporting structures thoroughly but with a certain degree of conservatism. He should be instructed in the procedure of dental stimulation, whether by means of stimulators or dental tapes. He should be urged to visit the dentist for observation at least once a month for a year following the completion of his oral rehabilitation.

The patient should, moreover, be firmly impressed with the importance of maintaining a high degree of physical resistance by the consumption of either synthetically prepared vitamin C and B complex or, preferably, fruits and vegetables and other foods which contain these two highly important aids to healthy body tissue.

Unless the factors outlined in the follow-up treatment of Vincent's infection are carefully and thoroughly carried out, the entire treatment is useless. There will be a recurrence. Fundamentally, the dentist should emphatically admonish the patient in regard to the possibilities of recurrence and the necessity of oral rehabilitation and the maintenance of a high degree of oral hygiene.

Fig. 22—Proper technique for brushing the buccal surfaces of the upper molars. The stroke is begun well above the gingival margin, to stimulate the supporting structures, then proceeds occlusally.

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Ninety Cases of Fractured Jaws

A United States Army general hospital in Italy made the following report of causes of fractured jaws and the type of fixation employed in treatment, for the six-month period ending 15 March 1944:

Fractures resulting from missiles, 63, and fractures resulting from blunt force, 27 (battle casualties, 73; nonbattle casualties, 17).

Fractures involving mandible, 54; fractures involving maxilla, 19; fractures involving zygoma, 12; fractures involving multiple facial bones, 5.

Patients treated with loop wiring and intermaxillary elastic traction, 38; patients treated with external pin fixation, 5; patients returned to duty, 47.

—From *The Bulletin of the U. S. Army Medical Department*, 4:22 (July) 1945.

Rubber Tubing in Penicillin Drip

SOME rubber tubing used in penicillin drips has been found to destroy from 25 to 50 per cent of the solution. The *Lancet* (10 February 1945) suggests a simple test of the tubing: Immerse a one-inch length of the sterilized tubing in 10 cubic centimeters of penicillin solution containing about 100 units per cubic centimeter. Incubate for three hours at 37° C. with a control of the same solution without the tubing. Then assay the penicillin; samples of tubing producing appreciable inactivation should be discarded for this purpose.

—From *Hospital Corps Quarterly*, 18:51 (June) 1945.

The Editor's Page

If each year the entire population in a city the size of Hartford, Connecticut, or Grand Rapids, Michigan, were destroyed by some disaster or epidemic, it would be a calamity of the first magnitude and a subject of anxiety and agitation to all people. That many people, about 163,000, die every year from cancer. If all the living cases of cancer each year were placed in one city, the population would equal that of Denver or Atlanta. So many sufferers from one disease, 300,000, concentrated in one spot, would open the eyes of the civilized world to the magnitude of the problem.

According to the American Society for the Control of Cancer, malignant disease is on the increase. "Some of this is undoubtedly due to the fact that our methods of recognizing the disease have greatly improved in recent years. The fact that doctors and the general public are much more willing to admit the incidence of cancer and to record it as a cause of death is also responsible for part of the apparent increase. So, too, is the marked increase in the average age of our population. Many more individuals are reaching the age groups in which cancer is most common, having escaped death during infancy or adolescence."

Dentists occasionally see early cancer of the lip, tongue, floor of the mouth, gingival tissue, and cheek. It is not our responsibility to treat these conditions. It is our responsibility, however, to recognize them and to refer the patients to competent medical people who are prepared to treat the cases. In speaking of mouth cancer, the American Society for the Control of Cancer says:

"A large proportion of the cancers arising in and about the mouth are preventable. The abnormal changes which precede cancer within the mouth usually occur in such locations that they can readily be seen or felt by the patient, while those upon the lip are too conspicuous to be overlooked by anyone. Many of these precancerous conditions are harmless at first and the change to malignancy, when it occurs, is usually a slow one, so a patient usually has time to have them corrected provided he appreciates the potential danger. A heavy smoker in whose mouth white patches develop and persist should give up the use of tobacco. A foul or unhealthy condition of the mouth, the result of pyorrhea or decaying teeth, should be promptly corrected. Ill-fitting dental appliances, which cause pressure or sores upon the gums, tongue, cheek, or lips, require proper adjustment without delay. Likewise, jagged or rough teeth, causing sores or ulcerations by constant rubbing on any part of the mouth, should be smoothed off or removed. If, after removal of the cause, an irritated area fails to heal promptly, the persistent sore may be an early cancer and competent medical advice should be sought. A crack in the skin of the lip, which fails to heal, a warty overgrowth or a patch of leukoplakia on the tongue or mucous membrane of the mouth or cheek, which enlarges, thickens, or bleeds, should be regarded as a danger sign and medical advice should be obtained."

The dentist's opportunity in preventive medicine reaches outside the tissues of the mouth. If he knows enough, is alert enough and interested enough, he may save many people from an unnecessary and a hard, early death by recognizing those conditions that may suggest the danger signs of cancer and by referring these people to competent physicians and surgeons.

According to the American Society for the Control of Cancer, the eight danger signs are:

"1. Any lump or thickening anywhere in the body, especially in the breast.

"2. A discharge or abnormal bleeding from the nipple or any of the body cavities.

"3. A crack or sore that does not heal, especially after an associated source of irritation has been removed.

"4. A sudden change in the size or color of a birthmark, wart, or mole.

"5. Persistent hoarseness, sore throat, or difficulty in swallowing.

"6. Persistent digestive symptoms in those who are over forty.

"7. Blood appearing in the urine or stools.

"8. Any change in the normal bowel habits."

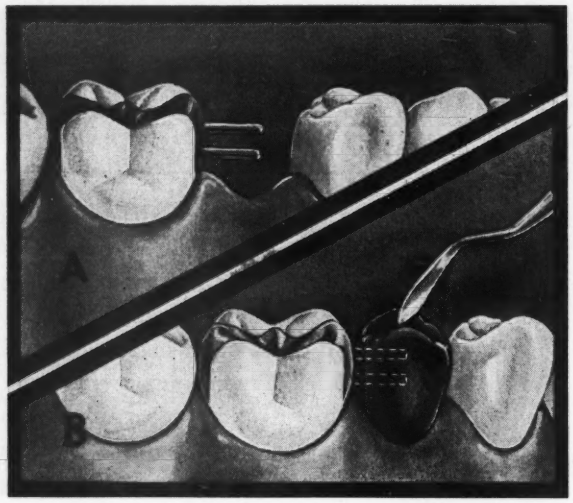

Fig. 1

Replacement of a Lower Second Bicuspid

Philip H. Sheridan, D.D.S., Dubuque, Iowa

Fig. 1—A conservative method of replacement of a lower second bicuspid using a single abutment is as follows: After the mesio-occluso-distal wax pattern has been completed for the first molar, insert two gold pins, 4 to 5 millimeters in length, into the mesial surface (A). Cast. When the casting is completed, place the inlay on the tooth and carve the second bicuspid pontic to form and contour (B). The pontic may be made in gold or acrylic. This method makes it unnecessary to take impressions or to articulate casts.

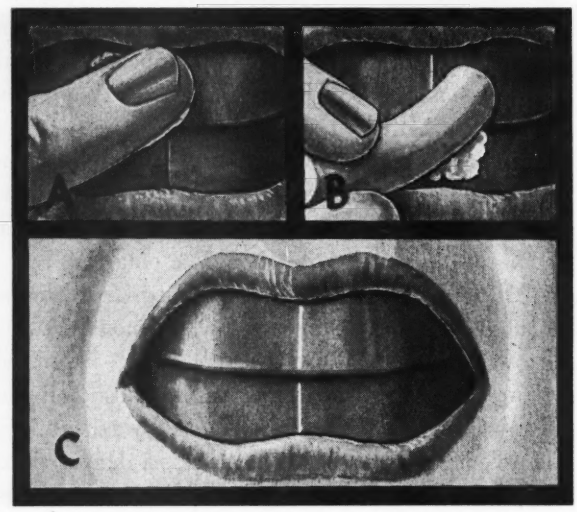

Fig. 2

Determination of the Median Line of Wax Bite Blocks

Lucian G. Coble, D.D.S., Greensboro, North Carolina

Fig. 2—After the bite blocks are adjusted for vertical height and for occlusal relationship, mark the median line of the wax with a sharp instrument (A). Wet the finger, touch it in dry plaster, and rub it across the line. Remove the surplus plaster with a cotton roll (B). The resultant white line (C) will stand out prominently.

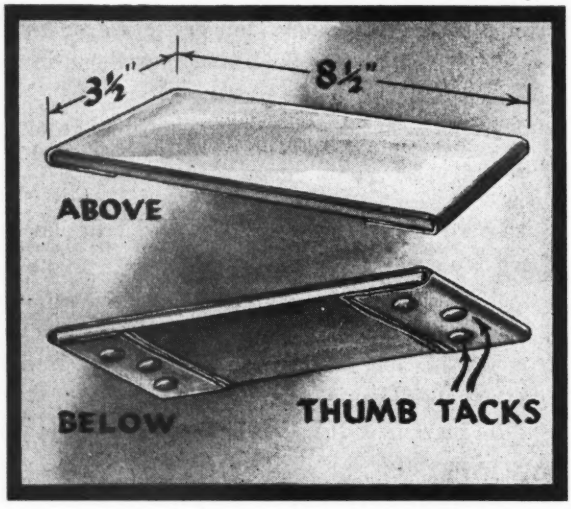

Fig. 3

A Handy Pad for Use in Spatulating Impression Pastes

Alexander Swett, D.D.S., Brooklyn

Fig. 3—Cut a thin wood board to 3½ by 8½ inches in size. Attach forty to fifty strips of heavy wax paper to the board with thumb tacks. After a sheet of paper is used for spatulating a zinc oxide-eugenol impression paste, the sheet may be torn from the pad and discarded.

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SUGGESTIONS . . . .

Pre-Extraction Treatment of Pericoronitis

Captain Philip M. Blumenfeld (DC) AUS, Tampa, Florida

Fig. 4—Before removing a lower third molar that is the site of a pericoronal infection, it is well to insert a cotton dressing carrying zinc oxide and eugenol. Insert this pack under the soft tissue flap at the distal of the third molar, and allow the dressing to remain in position for twenty-four hours before removing the tooth. This treatment is bacteriostatic and acts as an obtundent.

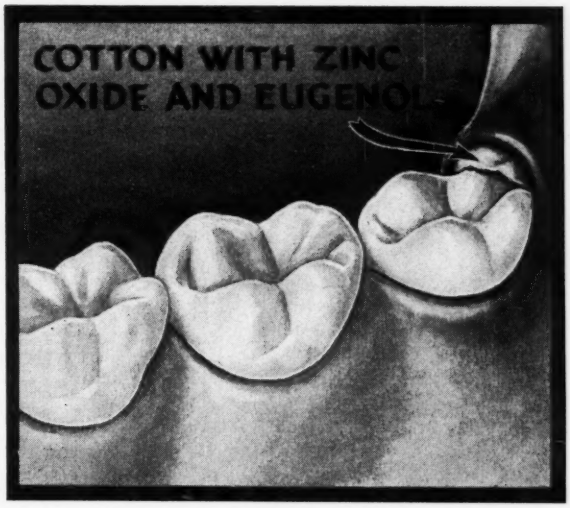

Fig. 4

A Modified Saliva Ejector

Mark S. Brown, D.D.S., Williams, Arizona

Fig. 5—The ordinary metal saliva ejector frequently is irritating to the tissues of the floor of the mouth. By reshaping the metal tube (A), a shape (B) may be created that will be more tolerant to tissues. The original tube is heated in a flame and bent to the adjusted shape with a suitable pair of pliers.

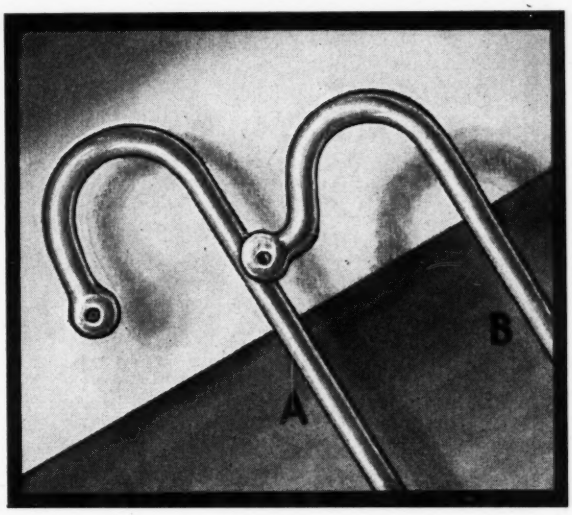

Fig. 5

An Instrument for Making Wax Patterns

Alejandro Graf, D.D.S., Ramirez, Argentina

Fig. 6—It is necessary occasionally to add wax to a pattern that is being contoured and carved. To hold the melted wax in position for application, a cup-shaped instrument is made by grinding a concave depression in the flat working face of the Woodson instrument (A). The wax is applied with this altered instrument to the exact position on any tooth surface (B).

(*Continued on page* 510)

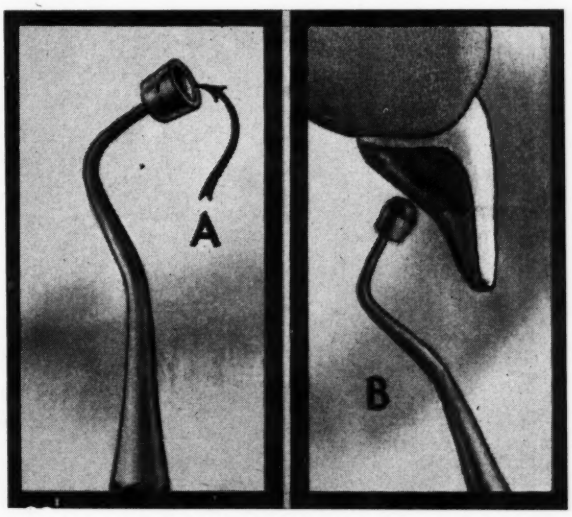

Fig. 6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time.

Turn to page 536 for a convenient form to use.

Send your ideas to: Clinical and Laboratory Suggestions Editor, THE DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

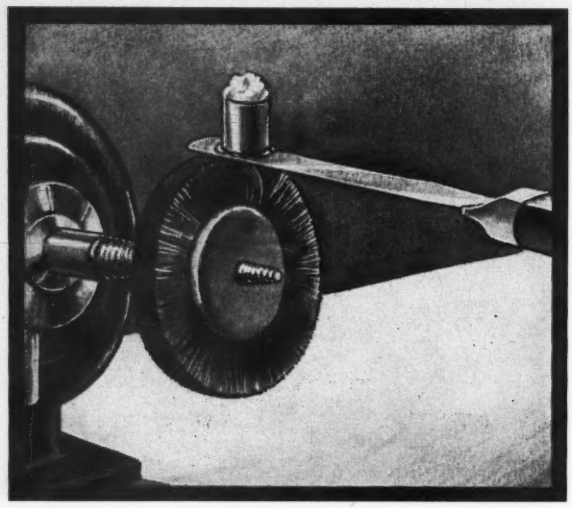

Fig. 7

A Vibrator for Investing Inlays

F. L. Patterson, D.D.S., Seattle

Fig. 7—Fasten the inlay base and ring to a plaster spatula with wax. Apply the investment in small amounts, and vibrate to place by holding the spatula in light contact with the brush wheel on the laboratory lathe. This method assures a hard, dense investment free from air bubbles.

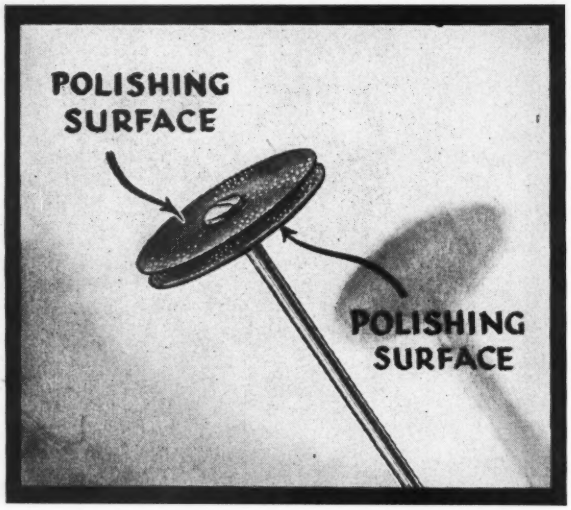

Fig. 8

A Double-Surface Finishing Disc

J. Campbell Thompson, D.M.D., Boston

Fig. 8—Instead of mounting sandpaper, carborundum, garnet, or cuttlefish discs singly, they can be mounted in pairs, back to back, on the mandrel. This permits polishing with either side. The double thickness of discs adds bulk and increases the rigidity of the discs on the mandrel.

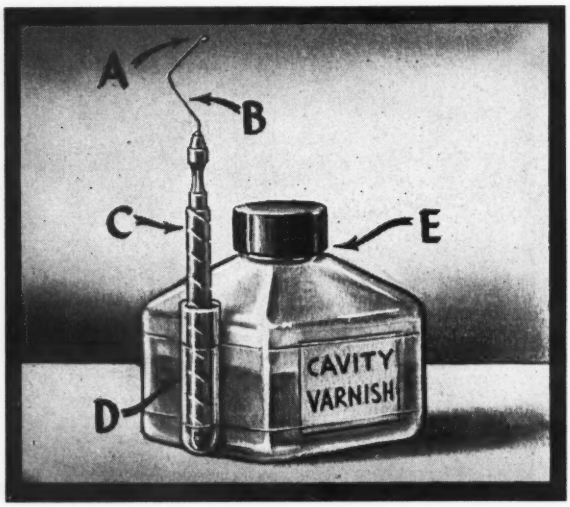

Fig. 9

A Cavity Varnish Bottle and Applicator Unit

Chester J. Henschel, D.D.S., New York

Fig. 9—Form a loop at the end of a hard, stainless steel wire (A) to engage a small piece of cellulose paper, and bend the wire in the form of a contra-angle (B). Fasten the wire in a broach holder (C). A piece of glass tubing of suitable size, and which has been sealed at the bottom, is used as a scabbard (D). The scabbard is held in position in the bottle with Scotch tape. The small piece of paper in the wire loop is the best kind of applicator to use to apply cavity lining. Vaseline is applied to the cap of the bottle (E) to prevent sticking.

SUGGESTIONS (Continued from page 509)

A Method of Making Die Stone Models

B. Placek, D.D.S., Chicago

Fig. 10—Wrap the discarded lead foil from an x-ray film around a copper tube impression (A and B), and pour in stone. The die produced by this technique will be smooth and of good form (C), and the extended length of the model facilitates handling.

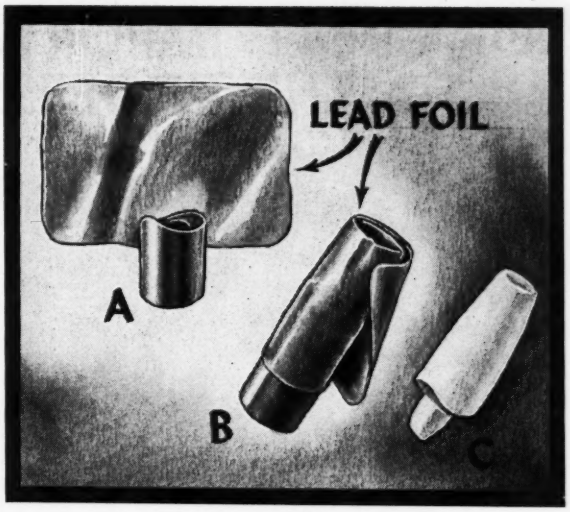

Fig. 10

A Cotton Roll Holder Made From a Rubber Dam Clamp

Myrton J. Billings, D.D.S., Brooklyn

Fig. 11—Solder two wires of suitable length to a number 14A Ivory rubber dam clamp, and sharpen the points of the wires. Pierce the cotton rolls with a sharp, straight explorer, and place the rolls in position on the wires. The clamp, with the rolls in position, is placed on the tooth of choice. This appliance allows adjustment of the cotton rolls to fit any condition.

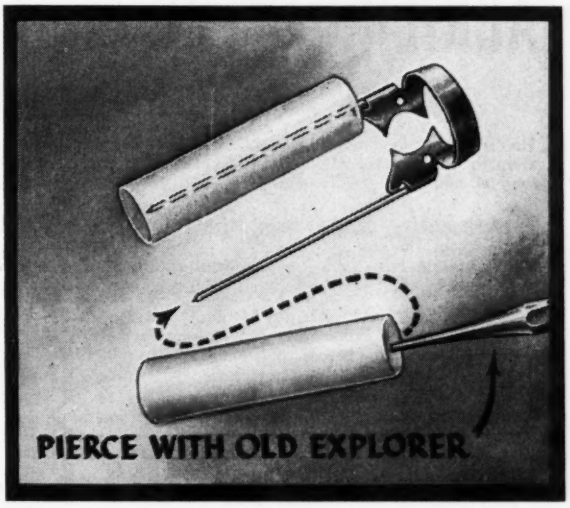

Fig. 11

An Individual Tray for Colloid Impressions

B. H. Scheffer, D.D.S., Chicago

Fig. 12—Make a plaster model from a snap modeling compound impression, and adapt a piece of the lead tubing that contained the colloid powder to the model (A). Adapt two thicknesses of baseplate over the lead (B), and insert a wire handle in the baseplate. The tray then is trimmed and perforated (C). The individually fabricated tray is now ready to use to take the colloid impression.

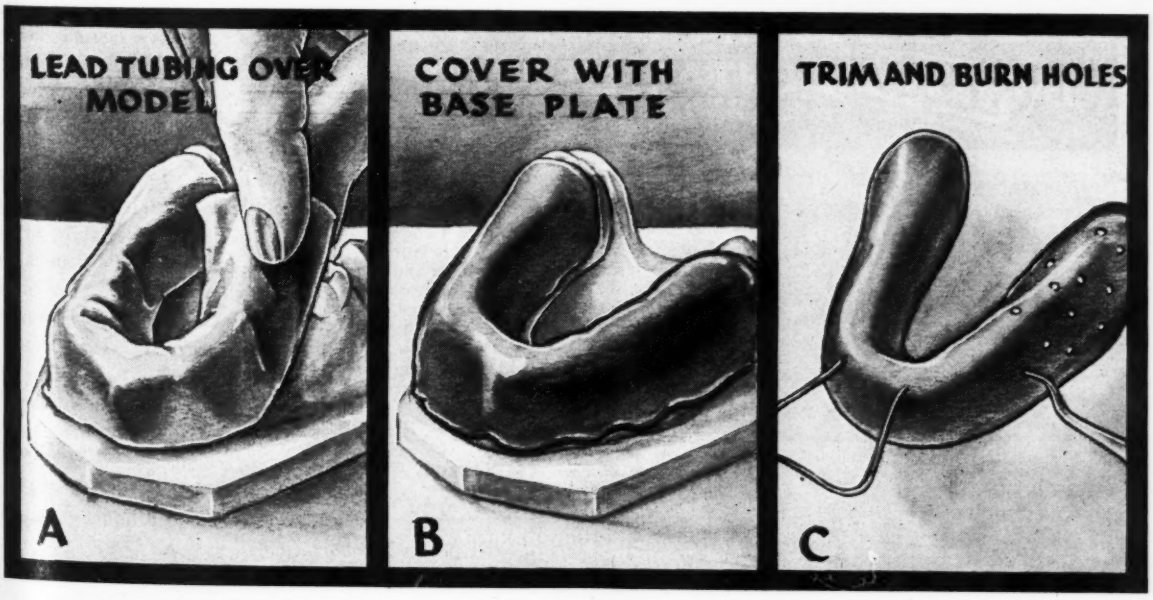

Fig. 12

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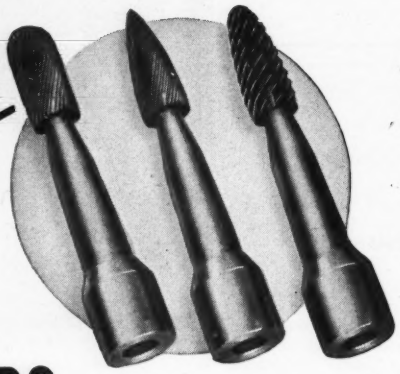

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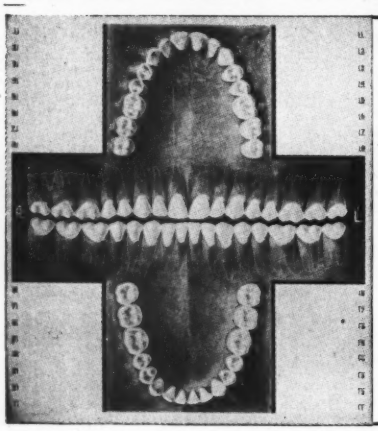

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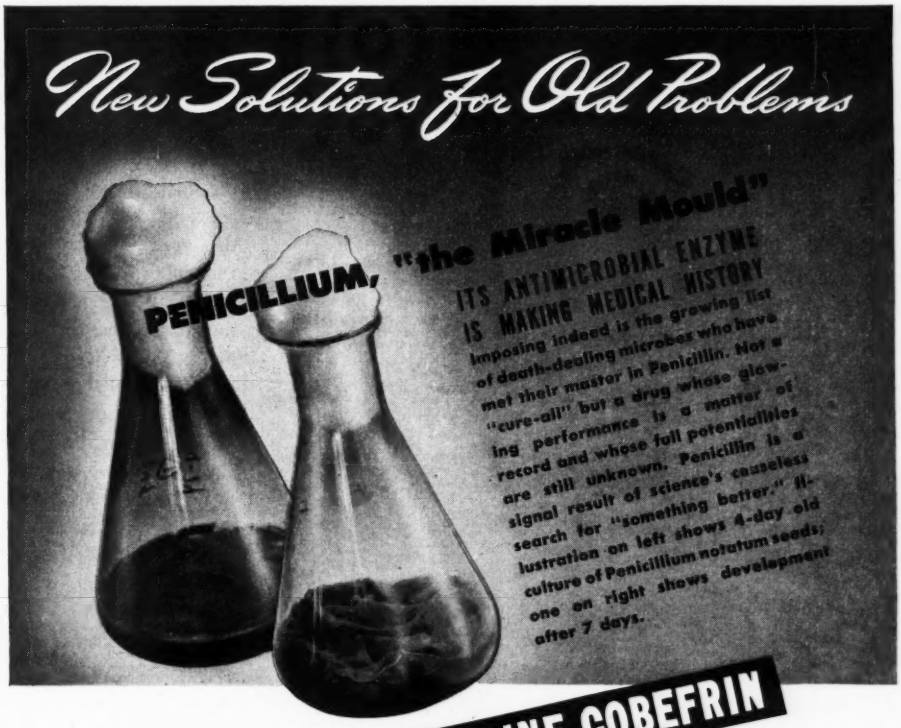
From the Earth Comes Life . . .

From the good earth comes life: food, clothing, and shelter. From the earth come many of the herbs from which the drugs are extracted that are used in the treatment of disease: opium, digitalis, atropine, and quinine, for example. Now we are learning that the bacteria of the soil are the natural enemies of some of the pathogens that produce disease in Man. *Bacillus brevis* is the name of the spore-bearing soil bacillus. The active principle of *B. brevis* destroys staphylococci and is bactericidal to all gram positive organisms. The active principle, upon purification, yields two crystalline fractions, gramicidin and tyrocidine. These antibiotics belong in the new categories of therapeutic agents along with the mold product, penicillin.

It seems somewhat ironic that mold and dirt, which we have so long considered as contaminating agents, have within them the power of destroying bacteria. Maybe the dirty-handed boy who does not wash his hands before he eats is actually better off than the person who does. That, of course, is something that precise mothers would find hard to believe. The mold on bread or any other edible may, in fact, be something that we should be eating rather than throwing away. We certainly know that meats and cheeses are unpalatable if they have not undergone some putrefaction, or at least some change with mold formation. I remember that several years ago a worker in the New York Aquarium observed that the dermatitis on his hands cleared up when he had immersed them in the fish tanks. Apparently the fish excreted some product that was bactericidal.

(*Continued on page* 514)

New Solutions For Old Problems


PENICILLIUM, "the Miracle Mould"
ITS ANTIMICROBIAL ENZYME IS MAKING MEDICAL HISTORY
Imposing indeed is the growing list of death-dealing microbes who have met their master in Penicillin. Not a "cure-all" but a drug whose glowing performance is a matter of record and whose full potentialities are still unknown. Penicillin is a signal result of science's ceaseless search for "something better." Illustration on left shows 4-day old culture of Penicillium notatum seeds; one on right shows development after 7 days.

NOVOCAIN-PONTOCAINE-COBEFRIN

Indelibly inscribed in the annals of Dentistry is the outstanding performance of another drug born of science's search for "something better" — Novocain-Pontocaine-Cobefrin. No longer need the dentist labor under the limitations of conventional 2% anesthetic solutions in those numerous operative and surgical procedures where anesthesia of a *deep, profound, prolonged* character is indicated.

Novocain-Pontocaine-Cobefrin is a formula especially compounded to give that type of anesthesia *without an increase in either Novocain concentration or vasoconstrictor content* . . . thanks to the big difference science found just a little* Pontocaine can make in a standard Novocain 2% solution.

**Only fifteen one-hundredths (0.15) of one percent.*

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170 Varick Street, New York 13, N. Y.
Laboratories: Wheeling, W. Va. & Springville, N. Y.

(*Continued from page* 512)

Our concept of organic and biologic chemistry will be changing constantly as we discover more things of the earth that are beneficial in treating the diseases of Man.

Weston A. Price . . .

Dentists should be proud of the contributions made to science by a colleague, Weston A. Price, formerly of Cleveland. Doctor Price, in his travels throughout the world, showed that dental degeneration came with civilization. He showed, too, that foods have qualitative values as well as quantitative values. A pound of butter purchased in the open market in a great city is not in any sense qualitatively the same as a pound of butter freshly churned from milk produced by cows grazing on the early spring grasses that were grown on land where the soil is rich in minerals. The anemic hothouse tomato that never felt the rays of the sun is not the same in its vitamin C content as a tomato picked lush and warm from the vine in the outdoor garden in the late summer.

I remember years ago visiting Doctor Price in his laboratory in the old house on Euclid Avenue in Cleveland. I remember, too, a lunch that we had in a settlement house where the pale children of the Depression were being fed by some church group. These children were being fortified with rich butter and with the vitamins and minerals developed by Doctor Price. I saw and felt dental caries that had been arrested by this nutritional reinforcement program. I saw and felt the dark, hard, sclerotic dentine that represented an attempt on the part of this organic tissue to defend itself. I remember, too, that Weston Price suggested to the American Red Cross that the people on unemployment relief be fed whole grains rather than bleached, polished white flour.

All this happened years ago when Weston Price, the dentist, tried to show the world that foods had qualitative values. Now we find the scientific and popular literature full of this subject. Recently the editor of *Organic Gardening*[1] paid a warm tribute to Doctor Price as a pioneer. *Harper's Magazine* for August had an important article on foods.[2] Many of the facts mentioned there were known and explained by Weston Price a score of years ago.

A Lawyer Has His Say . . .

A befuddled lawyer, confused by the directives and regulations sent out by government agencies, was asked by the Reconstruction Finance Corporation for information about the owners of a piece of land in Louisiana before the year 1803. The lawyer responded thus:[3]

"Gentlemen:

"Your letter regarding titles in case No. 198156 received. I note that you wish titles to extend further than I have provided them. I was unaware that any educated man in the world failed to know that Louisiana was purchased from France by the United States in 1803.

"The title to the land was acquired by France by right of conquest from Spain. The land came into possession

[1]With the Editor, Organic Gardening, 7:4 (August) 1945.
[2]Rorty, James, and Norman, N. P.: All the Food That's Fit to Eat, Harper's Magazine. 191:138 (August) 1945.
[3]Chicago Daily News (June 7) 1945.

What is the secret of *Glareless Shadow-Reducing* light in the *Castle* "T-V"?

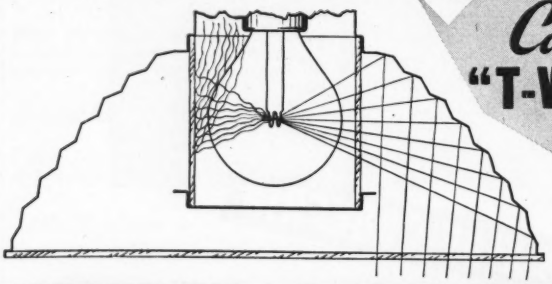
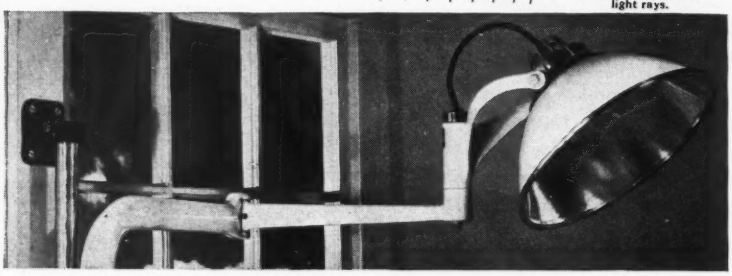


Diagram shows how light is reflected by some of the 28 steps in the Castle Reflector. Wavy lines show how filter blocks off heat rays and excess reddish and yellowish light rays.



There's no magic in Castle's famous *quality* of light . . . it's the result of an ingenious application of modern optical science. The 28-step reflector of the Castle "T-V" produces 56 beams of light which criss-cross and create a soft light dispersion that eliminates glare and highlights.

The shadow-reducing quality is due to the multiplicity of light cones created by the reflector sectors and to the large size of the reflector which gives a wide angle from which the light is reflected.

For further details of the Castle Tru-Vision Light, the ideal illumination for precision dentistry, write WILMOT CASTLE CO., 1123 University Ave., Rochester 7, N. Y.

Castle LIGHTS AND STERILIZERS

of Spain by right of discovery made in 1492 by a Spanish-Portuguese sailor named Christopher Columbus, who had been granted the privilege of seeking a new route to India by the then reigning monarch, Queen Isabella.

"The good Queen, being a pious woman and careful about titles (almost as careful, I might say, as the RFC), took the precaution of securing the blessing of the Pope of Rome upon the voyage, before she sold her jewels to help Columbus. Now, the Pope, as you know, is the emissary of Jesus Christ, who is the son of God, and God, it is commonly accepted, made the world.

"Therefore, I believe it is safe to presume that He also made that part of the United States called Louisiana.

"And I hope to h—— you are satisfied."

What I Wish I Could Learn From My Dog . . .

My dog has many qualities that I wish I had: good sense about food, the ability to relax, and an equanimity of spirit. My dog, or any other dog for that matter, will not eat just because the clock says it is mealtime or because food is available. The dog trainer tells us that a dog should be given his food, and that if he does not eat in a reasonable time the food should be taken away from him. That theory is man made and should be ignored. Man eats when the dinner bell rings or when the hands of the clock indicate that it is the proper time. We do not necessarily eat when we are hungry but eat from habit. Maybe that is what is wrong with us. A dog has the instinct to eat when his organism is ready. Man eats even if he isn't ready in stomach or in spirit.

We who call ourselves human beings have allowed our instincts to become submerged with a lot of notions and prejudices that other men have inflicted upon us. There are self-appointed social arbiters who tell us at which angle to hold the fingers in eating and at what level to hold the napkin. Others are the venders who tell us what is good for us to eat. They assure us with particular vigor if they happen to be selling the stuff. The dog eats the way he wants to eat. Sometimes it is a tentative whiffing and gentle nibbling. At other times it is a downright ravenous bone-gnawing job that he does.

I have handed a dog what I thought to be a good looking beef bone with some meat on it. The dog buried it promptly, to recover it at a time of relative famine or when the putrefactive processes have set to work. Dogs put aside their bones for days of want. When they dig up a bone teeming with maggots and rich in smell, we are offended. But the dog instinctively may know something about maggot therapy and about the action of *Bacillus brevis* and its active components. Only in recent years have we learned that maggots do, in fact, destroy infection and that the soil possesses bactericidal properties. The dog has always known this.

Only real threats seem to disturb the dog's equanimity. The bark that he gives for alarm is quite different

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Better results have been obtained with

OPOTOW IMPRESSION PASTE

Now another difficult step is taken care of properly with

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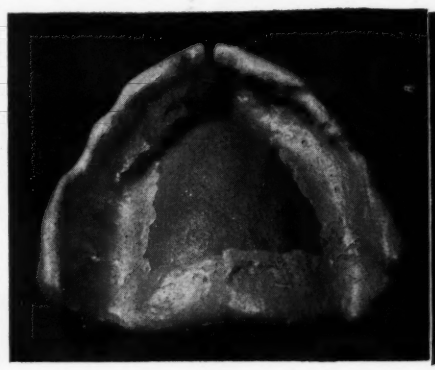
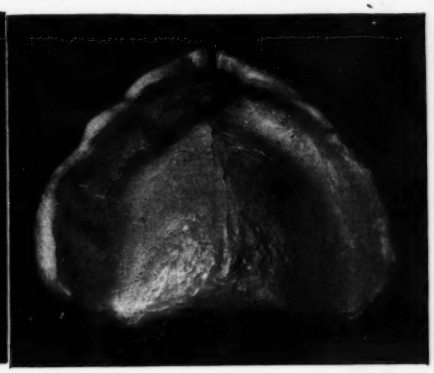
BECAUSE Opotow Peripheral Paste has the necessary physical properties . . . entire peripheral border can be obtained in one insertion. Over- or under-extension and over-compression of tissue is eliminated.



A PERFECT Peripheral Border—Taken with OPOTOW PERIPHERAL PASTE



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YOUR

July 17,1945

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Dear Sirs:

I am enclosing a check for one dollar for a copy of Visual Education.

The copy in my reception room has been handled so much that I would like to replace it.

Since

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The letter reproduced above is typical of requests we are receiving almost daily. We have conclusive proof that this series of charts, VISUAL EDUCATION IN DENTISTRY, has been *and still is* the most widely used patient-education material since the charts were introduced some years ago. The total sale is now nearing 80,000.

If your copy needs replacing you can obtain a *new* copy at the special subscriber price of $1.00. If you have never used these charts in your practice, may we urge you to enter your order now at the special rate? You will find many uses for the charts.

Many practitioners are ordering *two* copies—one for reception room use and one for use at the chair. Please indicate your preference when sending in the convenient order form below.

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I am a subscriber to The Dental Digest. Please enter my order for 1 ☐ copy; 2 ☐ copies of Visual Education in Dentistry. My remittance at the rate of $1.00 per copy is enclosed herewith.

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Address .....

Dealer .....

from the one that he gives when his adrenalin reaction has set in. When the hairs on his neck bristle and he shows his canines, the reaction is quite different from the mobilization reaction that he has when the fear is only remote or imaginary. The kind of growl and bark that he gives to his friends is totally different from the one that he gives to his enemies.

I should like particularly to learn the power of relaxation that the dog possesses. We have been told a great deal recently about the necessity of relieving our tensions by relaxation exercises and procedures. Apparently if we keep in a state of chronic tension, serious things happen to our tissues and organs. Tension is unknown by the dog. He flops down whenever he feels like it, stretches out limp, and takes a doze for himself at any time of the day. It would be well if we could do the same. It is surprising to see that the fancy psychiatrists are now telling us how important it is to stretch out and unwind ourselves and bog down occasionally. The dog has known that all along.

Nor is the dog fearful of showing his affection. People, regardless of how warm their natures are, often hesitate or are a little embarrassed to express their affections and loyalties, even to their closest friends. The dog has no such inhibitions. If he likes you, he lets you know it by constantly tagging at your heels and licking your face when you least expect it and generally showing his approval. I wish I could learn some of these things from my dog.

Army Wife . . .

The wives of men in military service have taken a pretty hard beating. Not long ago, the wife of a dental officer did her griping in the letter column of the *Chicago Daily Tribune*.[4] She makes some mighty pertinent points. Here is her letter:

"My husband is a captain in the army reserve dental corps. He volunteered in 1941 and served thirty-four months overseas. He has amassed 115 points and, on the strength of his record and the fact that he knows

[4]Chicago Daily Tribune (June 23) 1945.

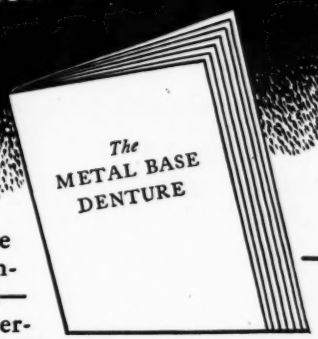
RENEW

Your Subscription for 1946

EARLY . . . .

THE DENTAL DIGEST 1005 LIBERTY AVE. PITTSBURGH 22, PA.

The SOLUTION you've been seeking for those 'PROBLEM' Denture Cases



You know what we mean—the "hard mouth" case, the "impossible lower," and so on—the ones that just don't fit perfectly in spite of all the skill and care you put into your preparation. And then there are those "extra special" cases where the mouth may be quite normal, but the patient an exacting one whom you are particularly anxious to please.

Whether your problem is one of overcoming anatomical difficulties or of enhancing professional prestige, you will find food for thought—and we believe for action—in the few logic-packed pages of the booklet we shall be glad to mail you at your request.

SEND FOR IT NOW—AND DECIDE FOR YOURSELF!

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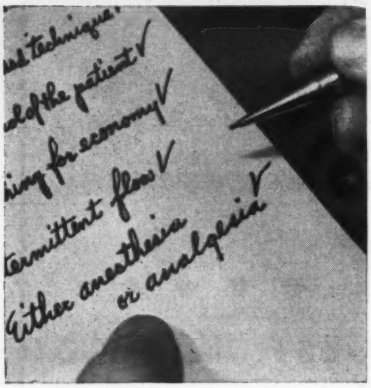

"Here are some of my reasons for choosing the NARGRAF"

"I wanted a machine that would produce anesthesia with maximum promptness and ease to my patient. I wanted the utmost in simple technique coordinated every possible safeguard for efficiency. I wanted instant control of dosage during induction and, naturally, I was interested in the greatest possible economy in gas consumption."

The Nargraf is designed to give the dentist what he wants for greatest efficiency in the administration of nitrous oxide anesthesia. The knowledge acquired in over thirty-five years close study of the operator's problems is built into the machine. The Nargraf has advantages not available in any other gas equipment. We shall be glad to tell you in detail what these advantages are. We urge you to talk to Nargraf users. Know the Nargraf, and the Nargraf will be your choice of a gas machine. Return coupon on page 539.

NARGRAF THE MCKESSON APPLIANCE CO. N_2O MCKESSON O_2 TOLEDO O. U.S.A. EUTHESOR

EASOR

there is an excess of dentists in the army, has asked for a separation from the service. This was refused on the ground that there is a shortage of dentists! Here again is the table of organization at work. My husband and thousands of others like him will be kept in the army to the bitter end so that the regular army officers in the higher brackets can keep their cozy ranks and salaries.

"My husband is now stationed at a large separation center, where thousands of separatees and discharged men come every week. Their only thought is to get the necessary red tape cut quickly so they can go home to their loved ones. But, no! Whether they need it or not, they are given dental treatment. Not because the army wants them to return to civilian life with healthy mouths, but because hundreds of dentists must be kept busy to keep the command functioning. Most of my husband's superior officers at this busy 'mill' have never been overseas.

"My husband always deplored nonethical tactics in his profession. Today he must stomach them without complaint because he is told to do so by his superiors. He is a disillusioned, embittered man, who gave four years of faithful service to his country, for which he has been repaid by cold indifference and sneering condescension by the racketeers of the army dental corps, whose 'closed shop' tactics frighten and appall the enlightened."

There has been a lot of talk recently about the excess number of medical and dental officers in the Army. I have a good many letters in file myself from dental officers who indicate that they are being kept on the job even when there is little to be done. The other day a group of physicians viewed with alarm the story in the newspapers that many of these men in the Medical Department are being kept in the Army as a potential nucleus for "state medicine" should the Wagner-Murray-Dingell bill become a law. That fear seems a little farfetched. It is not quite conceivable that the social planners, even in their most rosy moments, could

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expect to keep men in the service of the government against their wills after the war emergency is over. It is worthy of some investigation, however, to see why demobilization of officers in the Medical Department does not follow the same procedure as in other military departments. It is easy enough to see, of course, that line officers have no function to perform after battles are over, whereas medical and dental officers and nurses are required to care for the casualties for months and years after. It is time, though, that we had a clear-cut statement on this subject from the War and Navy Departments.

While the war was being fought the Army and Navy could be pretty arrogant in their public relations, but now that the hostilities are over, they can expect a violent reaction against any attitudes that are dictatorial or arrogant. The public relations program in the Army and the Navy will have to undergo some reconversion and redeployment, the same as all other military plans and organizations.—E. J. R.

The Treatment of Acute and Chronic Infections of the Jaw With Antibiotics

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Established Clinical Characteristics of Penicillin

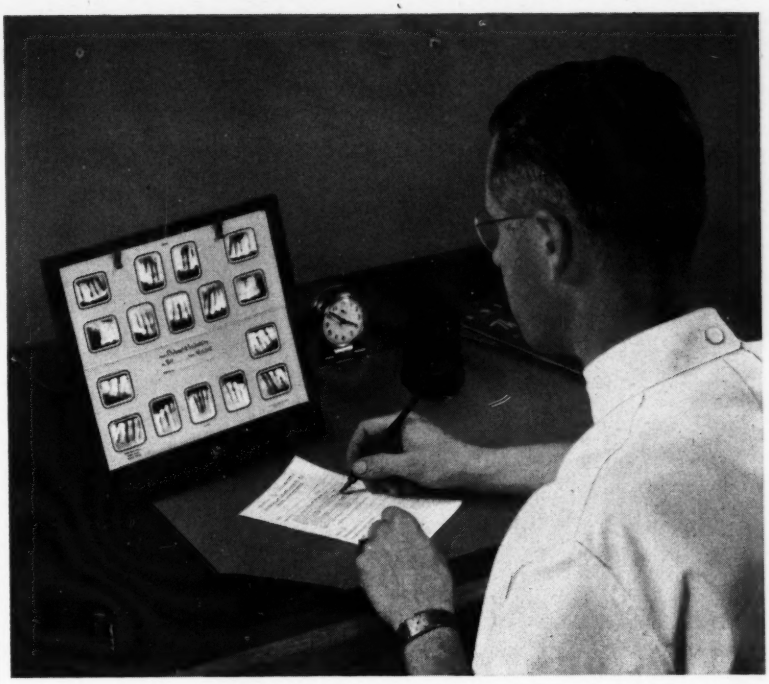
1. The penicillin available today is nontoxic in doses of immense therapeutic activity.

2. Its bacteriostatic potency is not appreciably inhibited by para-amenobenzoic acid, peptone, tissue secretions and exudates, pus, vitamin B, or large accumulations of bacteria.

3. Its action begins immediately on contact with susceptible organisms, without any lag interval.

4. It disseminates rapidly into all tissue and organs except the normal spinal fluid.

5. It is excreted so rapidly that fre-



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Employ These Efficient Eastman Diagnostic Aids

PROPER mounting of periapical and *Bite-Wing* radiographs assures an orderly anatomic presentation of the dental images . . . sets the stage for accurate interpretation. And, of course, adequate facilities for illuminating the radiographs during diagnosis are an essential, as well.

Ask your dental dealer to supply you with Eastman Dental X-ray Film Mounts and an Eastman X-ray Illuminator, Model D. The Mounts are made of light-gray bristol board with embossed, unbacked openings—in which radiographs slide into place easily and are held securely. Prices vary according to style; No. 16-B (illustrated), with 16 openings, hinged for filing or mailing, sells for $4.50 per package of 25. The Illuminator is of all-metal construction with 8 x 10-inch Eastman Blue-tinted Glass and 11-foot electric cord. It provides evenly diffused illumination. Price, $12.

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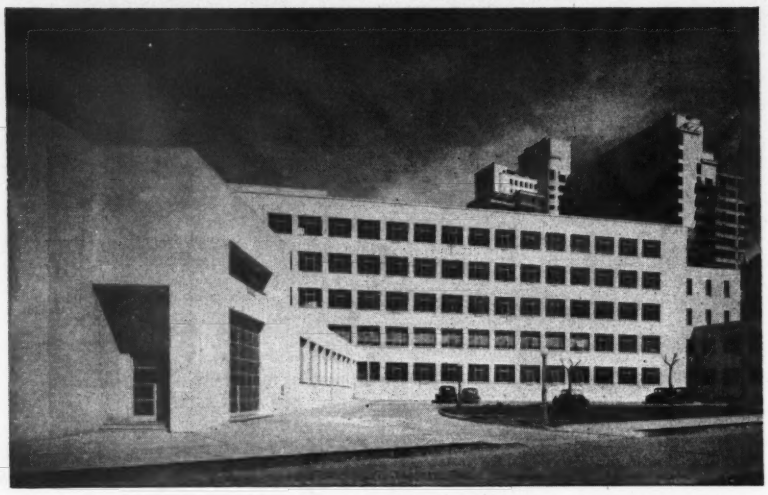
In your ORAL HYGIENE this month



Tuition-Free Dental School

It's down in Uruguay . . . but students from the United States (or any of the Latin American republics) may attend without charge. This modern tuition-free dental college has been financed in a most unusual manner—by government lottery.

Doctor Victor H. Sears tells about this school, and other schools in Latin America, in an interview on page 1522 of the current issue of Oral Hygiene.

★ ★ ★

"Proposals for Mass Production Dentistry Explained" . . . Here's that Hyser plan again . . . with Doctor John Oppie McCall clearing up what he calls the "fantastic confusion and misinterpretation" regarding the proposed group practice program. The article (page 1527) is in reply to Doctor Alfred J. Asgis' article (July Oral Hygiene).

★ ★ ★

"A Michigan Dentist Turns Ornithologist" . . . Leaving his dental office for the peace and quiet of Blaney Park, Doctor Karl D. Christofferson is now spending all of his time at work he loves—the study of birds. The article by William J. Duchaine (page 1530) is bound to start a lot of nature-loving dentists daydreaming, thinking of the time when they, too, may find happiness, contentment, and relaxation in the great outdoors.

★ ★ ★

"What Dentists Should Know About G.I. Business Loans" . . . There's a lot more to this loan plan than just handing the returning Service man two thousand dollars . . . In fact that's not the way it works at all. Harold J. Ashe gives a clear, detailed explanation of this Government provision, on page 1534.

★ ★ ★

"Letter from Burma" . . . Colonel Kenneth R. Cofield (DC) takes us along the Ledo Road and shows us his Army dental clinic set up in the jungles of Burma . . . He says, "Dentistry is making one of the outstanding contributions to the war effort." You will want to read the whole "letter" on page 1538.

★ ★ ★

"A Practical Retirement Plan for the Dentist" . . . Sounds good, doesn't it? . . . and it *is* good. It is a simplified plan worked out from many pages of figures and after many, many hours of consultation with insurance companies and their representatives. Doctor Arthur Elfenbaum explains it concisely on page 1542.

★ ★ ★

"Musings of an 'Engineer-Doctor'" . . . Doctor Arthur B. Berresford, who holds degrees in both electrical engineering and medicine, contrasts the two worlds in which he has worked . . . You will find this article on page 1551.

★ ★ ★

Seven articles and your nine favorite departments—all short, concise, and easy to read—are waiting to add pleasure, and value, to your leisure moments.

quent injections are required to maintain effective blood levels.

In many respects, too, penicillin appears to work on an all-or-nothing principle; that is, not only the length of time it remains in contact with susceptible organisms, but also the overwhelming impact of high concentrations, are decisive. Consequently, in the treatment of a local infection, subcutaneous or submucous injection close to the site may at times have certain advantages over intravenous or intramuscular routes. The lymph channels and the force of diffusion carry the penicillin through the lesion for a brief period while it is still concentrated. This brief, high-powered influx, followed by the secondary, sustained exposure to the drug as it is returned to the infection from the bloodstream, promises specific advantages in the treatment of dental infections.

Topical Application

1. Sockets of impacted mandibular third molars were dressed with gauze saturated with penicillin in saline, 1,000 units per cubic centimeter, in 4 cases, and with 1,000 units per cubic centimeter in beeswax and peanut oil in 4 cases. There was no discernible reduction in the anticipated postoperative sequence of pain, swelling, or trismus. Indeed, the comparative advantage of dressing similar wounds with sulfanilamide appeared overwhelming.

2. Penicillin in cellulose, 500 units per cubic centimeter, was applied to aphthous ulcers in 5 patients and the effect was compared with untreated aphthae in 4 patients. A slight, but inconclusive advantage in reduced pain and earlier resolution was noted in the treated group.

3. Perlèche rhagades at the labial commissures were treated with penicillin in cellulose, 500 units per cubic centimeter, in 5 patients. The lesions healed in 24 to 48 hours. Two patients had recurrences within a week which were subsequently controlled with riboflavin. An indurated, vesicular sore with surrounding edema and submandibular lymphadenitis, appar-

(*Continued on page* 525)

(*Continued from page* 520)

ently a reaction to penicillin, immediately developed in a patient with a scaly lesion on the cheek.

4. Deep ulcers in 3 patients with a leukemic stomatitis showed no response to penicillin, 1,000 units per cubic centimeter in cellulose. A diffuse cellulitis of the submaxillary region developed later in one patient. This resolved in 72 hours under intramuscular injections of penicillin, 20,000 units every 3 hours, and the ulcer healed simultaneously.

5. Penicillin in cellulose, 500 units per cubic centimeter, was applied to the gingivae in 14 patients with subacute fusospirochetal gingivitis. After 48 hours moderate improvement was noted in 5 patients.

6. Alveoalgia associated with dry socket was treated with crude *Penicillium notatum* in 2 cases and with penicillin in saline, 1,000 units per cubic centimeter, in 3 cases. The sockets were dressed daily and sealed with vaseline gauze. Response in terms of control of pain was dramatic, granulations appeared early, but final healing did not appear to be expedited.

Intramuscular Injection

Series 1—The response to penicillin treatment, 5,000 units every 3 hours, was studied in 6 cases of acute alveolar abscess, in comparison with a group of 6 patients treated with sulfonamides, and 6 patients treated with hot saline irrigations only. Fever subsided and swelling resolved far more rapidly in the group treated with penicillin, but there did not appear to be any clear cut advantage in the control of pain. *Positive cultures on media containing penicillinase were obtained from the apexes of all teeth on extraction.*

Series 2—Three patients with extensive, hard phlegmons of the submaxillary region with edema in the floor of the mouth were treated with penicillin. One case, receiving 15,000 units every 3 hours, cleared up in 48 hours. A second case, receiving 20,000 units every 3 hours, improved in 72 hours, but the cellulitis reappeared two days after discontinuing

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Many patients prefer the mild peppermint flavor of FASTEETH—so mild that FASTEETH is often described as tasteless. Flavor is important and the oil of peppermint has an analgesic effect—helps to prevent gagging.

Pleasant tasting FASTEETH is different, and your denture patients will notice and appreciate that difference.

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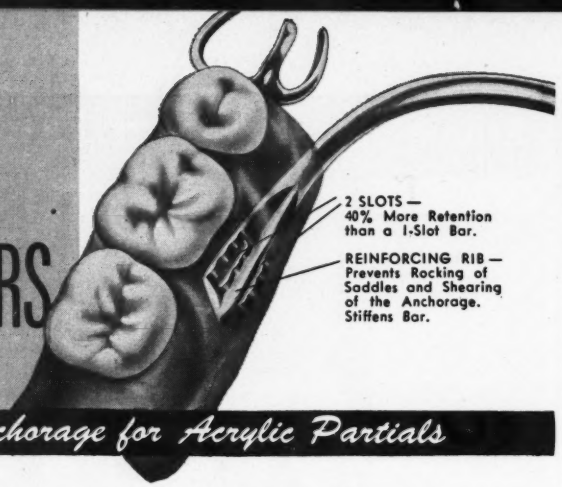
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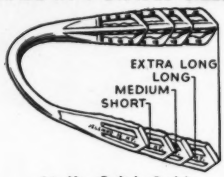

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therapy. At this time fluctuation was elicited and the abscess was incised and drained. A third case, also receiving 20,000 units every 3 hours, cleared up in 72 hours.

Series 3—Three patients with advanced osteomyelitis of the mandible received penicillin, 20,000 units per cubic centimeter, every 3 hours for periods ranging from 3 to 6 days. Fever subsided and the volume of pus draining from wounds diminished during the period of therapy, but returned to its original profusion shortly after penicillin was discontinued. Resolution was not influenced.

Series 4—Among 10 patients who were receiving penicillin for other conditions (3 subacute bacterial endocarditis, 1 gonorrhea, 4 pneumonia, 1 furuncle of the lip, 1 cystitis) varying degrees of gingivitis were noted in 6, and a mild profusion of fusospirochetes was demonstrated in the smears. On the basis of this evidence, intramuscular injection of penicillin does not seem to be consistently effective as a cure for gingivitis in which fusospirochetes could be demonstrated.

Subcutaneous and Submucous Injection

This mode of administering penicillin seems especially applicable to the treatment of infected lesions of the jaws, particularly if the causative organisms are somewhat resistant. When large doses were employed, some clinical improvement often was noted after a single injection, and some ambulatory patients were treated with a few doses daily. Intra-oral injections were made in some cases, and extra-oral injections in the region of the jaws were made in

others (see illustration). Among the disadvantages noted one stands out: There is a disagreeable numbing, burning sensation which persists for about a half hour when doses of 30,000 to 100,000 units are injected submucously. This is controllable to some degree by: (a) selecting penicillin which has a pale, yellow color, (b) injecting slowly, and (c) avoiding concentrations of more than 15,000 units per cubic centimeter of saline. It is completely eliminated by injecting procaine-epinephrine into the selected site 10 minutes before following up with penicillin.

Any site in the oral cavity is available for this method if it is not so near the infection as to risk great pressure from the mass of solution, and provided it is close enough for the lymph vessels to carry a large amount of penicillin through the lesion. The conventional points for conduction anesthesia offer the theoretical possibility that penicillin may be carried directly to deep seated infections, such as periapical abscess, by the vessels

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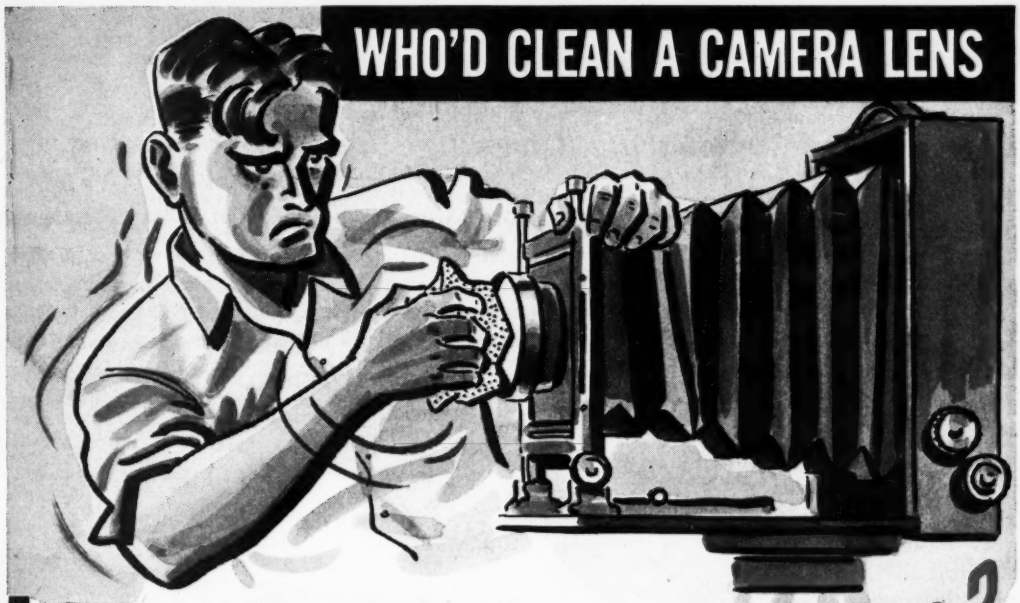

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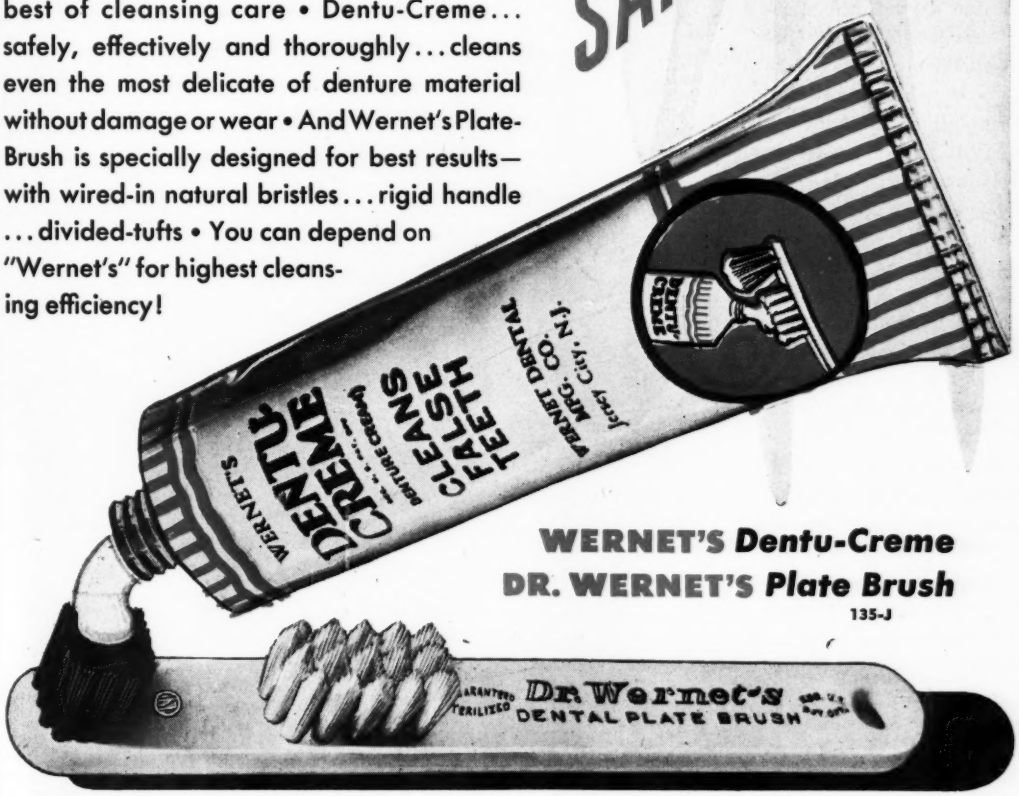

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which furnish the afferent blood supply to the part. Some clinical verification was found for this assumption.

Conclusions

1. With the technique employed, topical application of penicillin appeared to be of limited value in the treatment of ulcerative lesions in and about the mouth. One of the drawbacks to this method is that the agent is dissipated quickly in the mouth, and improved results may reward a technique which maintains the penicillin in contact with the lesion for longer periods. The pain associated with dry socket diminished promptly, however, and was contolled as long as the penicillin was applied.

2. Intramuscular injection of moderate doses of penicillin probably widens the margin of safety in the treatment of acute infections of the jaws, and brings them under earlier control. Recent experiences indicate that much larger doses, of the order of 100,000 units every 3 hours, are well tolerated and far more effective. Nevertheless, the need for surgical treatment is not always eliminated; indeed residual infection may be marked and exacerbate later. Patients treated with penicillin almost invariably feel more comfortable in terms of diminished malaise and pain shortly after therapy is begun.

3. Few, but large, doses of penicillin injected close to the infection, appear in some cases to be as effective as more frequent intramuscular injections. This method seems decisive in the treatment of pericoronitis, but it is experimental and not without risk.

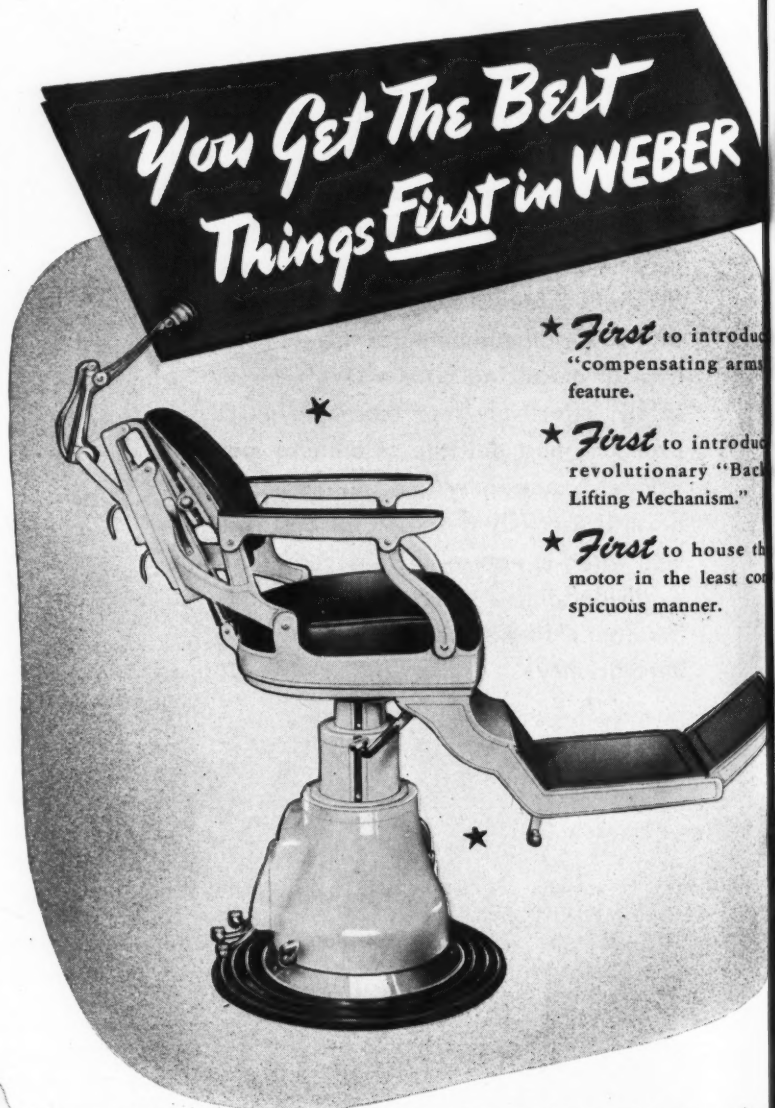
4. Many additional clinical data must be accumulated before the indications, limitations, and possible extensions of penicillin therapy may be gauged accurately, but ample evidence already exists that it is destined to be an invaluable adjunct in the management of many varieties of infections of the jaws.

—From *The New York Journal of Dentistry*, 15:225-230 (June-July) 1945.

The Etiology of Subacute Ulcerative Gingivitis

Capt. G. COCKER, L.D.S. (Army D.C.) and Lt. Col. J. W. BIGGER, M.D.

THIS INVESTIGATION was carried out to determine the importance of purely local factors and of general nutritional factors in the etiology of subacute ulcerative gingivitis. Sixty-five patients were thoroughly investigated dentally, medically, bacteriologically, and in the laboratory. An attempt was made to differentiate various types of ulcerative gingivitis by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correlating these examinations with the clinical findings. The patients were divided into four groups in strict rotation as they reported for treatment.

Treatments

Group A: Controls. No treatment.

Group B: General treatment only: Daily amounts in excess of any normal requirements of vitamins A, B_1, B_2, C, and D, nicotinamide, iron, calcium, and phosphorus.

Group C: Local treatment only, strictly limited to hydrogen peroxide irrigation, 1 per cent liquor arsenicalis application, thorough scaling, and removal of gross areas of sepsis.

Group D: The combination of the general and local treatments of Groups B and C.

1. In order to make it appear to the patients that no single group was receiving preferential treatment, additional inert local and general treatment was given to Groups A, B, and

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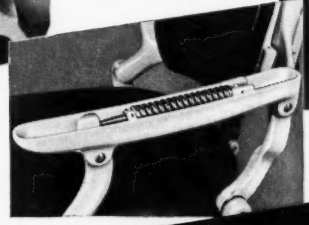

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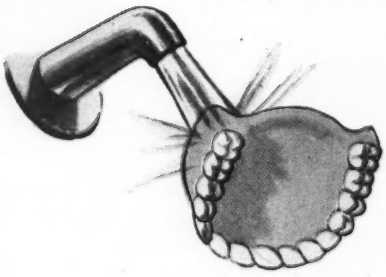

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C. This treatment satisfactorily maintained the confidence of the patients without influencing the prognosis and course of the oral conditions.

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4. The only personal oral hygiene permitted the patients was the use of cotton swabs soaked in a completely inert mouthwash after meals, in the morning, and at night.

5. Treatment was recorded as completed when all clinical ulceration had disappeared. Patients were re-examined subsequently each month for three months, during which time some of them received a daily dietary supplement of the forementioned vitamins and nicotinamide.

Types of Ulcerative Gingivitis

Two main types of ulcerative gingivitis were usually quite easily distinguished clinically: An active condition in which 23 per cent of the patients were included; and a second larger type, more or less inactive, forming the remaining 77 per cent of the patients. Bacteriologically there appeared to be no correlation with their clinical differences. Smears were taken, usually from several ulcerations in each patient, before, during, and at the conclusion of treatment.

Results of Treatment

1. Not one of the 17 patients in the control group who were given no treatment became clear of ulceration. The improvement noted in many of these cases was thought to be due to the improved hygiene which they were able to practice in the ward with cotton-wool and the inert mouthwash. There was marked deterioration in two cases. Thus it would appear that ulcerative gingivitis will not resolve spontaneously.

2. Of the 16 patients in Group B

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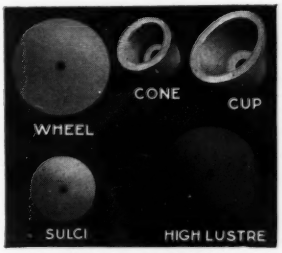

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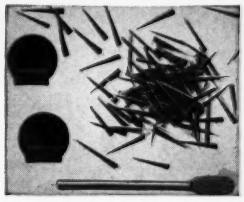

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who received the accessory food factors only the mouths of two became clear of ulceration; one deteriorated badly; and the remainder (13) showed a similar average improvement to Group A patients.

3. All the 16 patients of both Groups C and D which received active local treatment became clear of ulceration within fourteen days. The average number of days taken was 7.9 in Group C, as compared with 6.5 days for those in Group D.

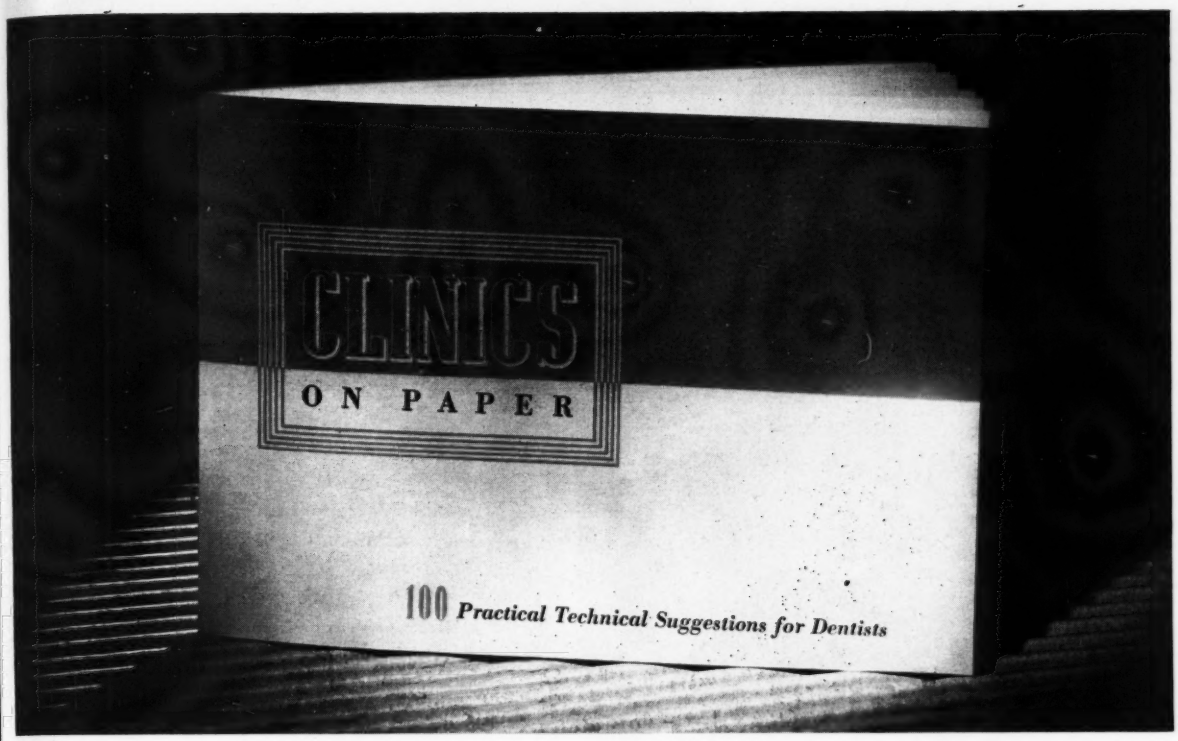
4. Fourteen patients in Group A and ten in Group B who were not clear of ulceration after fourteen days of treatment were transferred from A into Group D and from B into Group C, where they became clear of ulceration. The average time for Group C transfer cases to clear of ulceration was 4.8 days, and for Group D, 5.2 days.

Conclusions

1. Obviously some form of local treatment is necessary to clear ulcerative gingivitis. The possibility that the administration of large doses of the accessory food factors may be an adjuvant of some slight value cannot, however, be completely excluded. In this connection it must be pointed out that inasmuch as a partial denture was not worn while the mouth was under treatment, this was probably, in the main, responsible for the satisfactory result in one of the two cases which became clear with dietary supplement and without local treatment.

2. Fourteen days' prior saturation, which appeared to assist in the slightly more rapid clearing of ulceration when subsequent local treatment only was given, is thought to be of possible significance, though it is not of practical clinical application.

4. Twelve of 26 patients receiving additions of the vitamins and nicotinamide to their normal diet for three months following treatment remained clear of ulcerations. Of those receiving no additions to their diet, 8 out of 21 remained clear. The only advantage which might accrue from long-standing vitamin therapy is a general tonic effect.



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5. The bacteriologic investigation still leaves the role of *Spirochaete vincenti* and *Bacillus fusiformis* in subacute ulcerative gingivitis obscure. Advance in the destructive process proceeds pari passu with increase in the numbers of these bacteria to be found, and regression with decrease in their numbers, results which might be expected whether the organisms were causative of the condition or were mere saprophytes multiplying in a suitable nidus caused by other agents. If these bacteria are causative of the condition, the administration of dietary supplements appears to play no part in their elimination, which can be satisfactorily and quickly effected only by appropriate local treatment.

6. The medical and laboratory (hematologic and pH of saliva) findings produced no new significant evidence which could be correlated with the general results.

—From *The British Dental Journal*, 78:370 (June 15) 1945.

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Treatment

1. Under general anesthesia the tooth was opened from the cingulum, draining the root canal which was found to contain putrid material. The abscess was incised labially and palatally, and a fair quantity of pus evacuated. Hot mouthwashes were prescribed, and the signs of acute inflammation disappeared after a few days.

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3. The extracted tooth was put into a dappen glass with hydrogen peroxide, 100 volumes. Hydrogen peroxide usually is used in the weak concentration of 10 or 20 volumes, which has not sufficient penetrating power. Moreover, the highly concentrated hydrogen peroxide has a strong bleaching effect which is useful.

4. After effervescence had stopped, the tooth was removed and held in a Dettol-soaked napkin, and reamed. The canal was enlarged and the cavity prepared for the subsequent filling. The tooth was again placed into a fresh solution of hydrogen peroxide for a short time, and then the canal was washed with alcohol and ether and filled with thymol cement by means of a Lentulo canal filler (rotating wire-spiral in the handpiece) and gutta-percha point. After the cement had set, the apex was rounded and smoothed with a stone. Finally a small part of the periodontal membrane which seemed diseased was re-

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Sketch:

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moved. If possible, the periodontium is left untouched.

5. Thereafter the socket was curetted and syringed, and the tooth replaced, at the same time correcting its position and bringing it into alinement. This tooth had been in an overlapping position. Though preparations for splinting had been made, this was not done because of the relatively well preserved socket and having a cooperative and intelligent patient to deal with.

6. A high dosage of vitamin C was prescribed, which was used for the first time in replantation: 300 milligrams a day for a week after operation, 150 milligrams a day for the next week, and 50 milligrams a day for the next four weeks.

Results

I venture to suggest that the vitamin C medication was partly responsible for the smooth course of aftertreatment. The patient had no pain whatsoever afterward, and the tooth became firm soon. Mouth hygiene was impressed on the patient and she used mouthwashes three times a day.

A roentgenogram taken after five months showed a satisfactory result. On examination the tooth was found absolutely firm, in no way distinguishable from the neighboring teeth, and the gingiva was perfectly healthy. The patient stated that the tooth felt no different from the other teeth, and was fully functional.

Another roentgenogram taken after twenty-three months showed that the satisfactory condition had been maintained, and the clinical history confirmed that the tooth had been comfortable and functional throughout the whole period.

—From *The Dental Record*, 65:157 (July) 1945.

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